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ELECTRIFICATION OF THE WORKS OF THE JOHN N. ROBINS CO.*

By WM. T. DONNELLY.[†]



HE dry-docking plant of the John N. Robins Co., the largest ship repair and dry-docking plant in the United States, is located on Erie Basin, Brooklyn, N. Y., and comprises two basin dry docks; No. 1, 512 ft. in length, with 20 ft. over keel blocks, and No. 2, 620 ft. in length, with 25 ft. over keel blocks, at high tide. These are timber lined docks, originally built about the time of the close of the civil war, but since extensively rebuilt and enlarged.

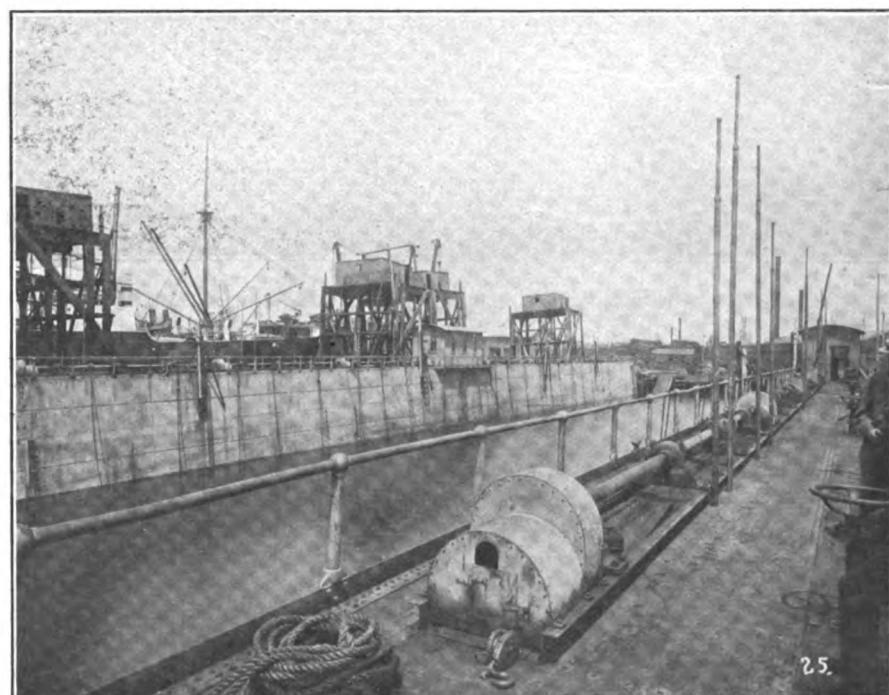
There are, in addition, three floating dry docks, one balanced dock of 4,000 tons, one sectional dock of 6,000 tons and one pontoon dock of 6,000 tons lifting capacity.

Fig. 1 shows the general location of these docks and buildings. The entire plant covers an area of 23 acres. The shops comprise a machine shop, with tools capable of handling the largest cylinders and crank shafts; a small machine shop with small tools for general repair work; a copper and sheet metal shop; a large boiler shop, with tools capable of handling the heaviest plate work; a blacksmith shop with steam hammers, furnaces and bending floor for forming ship's frames and other large shapes and a

carpenter shop with a complete equipment, machinery for joiner and other wood work. The plant, as a whole, has a capacity for dry docking, painting and repairing about 500 vessels a year.

Previous to the introduction of the equipment to be described, power was furnished by nine large steam boilers, of 1,700 horsepower, and operating

much of the time under an excessive overload. These boilers supplied steam to not less than 20 steam engines scattered over the works, ranging in size from a compound engine of 600 horsepower for pumping the basin docks and three steam-driven air compressors of 350, 130 and 120 horsepower, to various small engines of from 10 to 25 horsepower. With the exception of



6,000-TON PONTOON FLOATING DRY DOCK PARTIALLY SUBMERGED AT THE JOHN N. ROBINS CO.'S PLANT.

*Abstract of paper read before the Brooklyn Engineers' Club.

[†]Consulting engineer, 135 Broadway, New York City.

the steam plant for pumping the basin docks, all engines work non-condensing. The aggregate rated horsepower of the engines was approximately 2,000, and as the two floating dry docks and the new one under construction would require an additional 1,400 horsepower, it will be seen that the question of surplanting steam power by electricity for such a diversified and widely scattered plant was a very involved one.

Reasons For Change.

This plant, like many others, had developed through a long series of years without a consistent plan and consequently had reached a point where something radical must be done. The steam boilers were of the horizontal tubular type and on account of local conditions of buildings, two fire rooms were maintained at a considerable distance apart. There were no

plant. The great diversity of work to be done made this question a difficult one. The plant must often work at full capacity night and day and at other times there would be little work on hand. Again, the aggregate amount of power to be used when several dry docks were operating at one time, besides a large air-compressing plant, would mean a very large installation and an exceedingly low power factor. The sudden fluctuations in load, it being understood that a floating dock is usually pumped in less than one hour and a basin dock in about two hours, would create a demand for quick firing of boilers and a large force of firemen always on hand.

General Plan for the Introduction of Electricity.

A careful study was, therefore, made to determine the distribution and use of power and the yearly fuel con-

plans could be formed until the question of central station or independent generation of electricity had been settled. The decision as to a central station source of power having been reached, a general review of the application of power and the amounts was started, and it was decided to adopt the primary voltage of the central station for the larger units in the yard and for distribution about the works; the dry dock company to operate its own transformers for low voltage current adaptable to smaller motors.

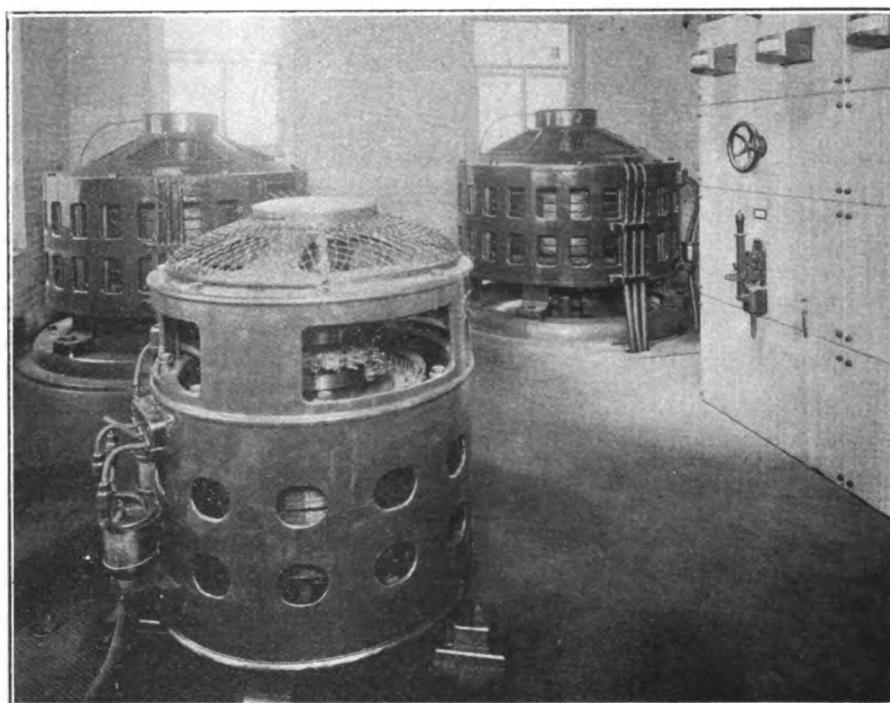
Current was introduced from the Edison mains at 6,600 volts, 3-phase and 25 cycles. A main substation, located as shown on the general plan, was provided for handling all high voltage connections. This station is located in a special structure elevated one story above ground, so as to improve the moisture conditions as much as possible. The switchboard is composed of 13 panels, two of which are used to handle the Edison current and the others for distributing high tension current to high tension motors, for compressing air and pumping the basin docks. Other switches distribute to local substations with transformers for various purposes.

All switches are of the standard oil type and each panel is provided with a time limit relay circuit breaker and with a recording wattmeter to furnish an independent record of the consumption of current for the different purposes to which it is applied, thus making it possible to charge up the cost of power for the different docks, machine shops, air compressors and other purposes.

Distribution of Power.

The general arrangement for the distribution and location of minor substations will be seen by reference to Fig. 2. The distribution of current to these stations is accomplished by underground conduit and lead covered cables. The conduits are of fiber encased in concrete and the cables are of the same standard as those used by the Edison Electric Illuminating Co., of Brooklyn, from whom the power is obtained. Manholes are provided at suitable intervals for hauling cables and every possible precaution taken as to drainage and protection from injury.

The actual introduction of electricity into this plant was occasioned by the building of the new 6,000-ton pontoon floating dry dock with steel wings, and the description of its introduction will therefore more or less center about the putting into operation of this



PUMP ROOM AND MOTORS FOR GRAVING DOCKS.

adequate facilities for handling or storing fuel and it was necessary to re-handle fuel separately for each fire room. The burning of soft coal under conditions of excessive intermittent demand for power resulted in smoke production which was strongly resented by local authorities. It was also quite apparent that some considerable economy should result from the proper application of electricity as compared with steam.

The first and most important question was as to the advisability of purchasing power from a central station or the installation of a generating

sumption, from which an operating cost was worked out as a basis for determining the maximum unit price which it would be possible to pay for current and still show a reasonable economy over existing conditions. This point determined, the matter was taken up with the local central station, and after an extended discussion a contract was finally arranged so as to favor the central station as much as possible as to peak loads, and the dry dock company as to having a large amount of power available at any time of day or night.

It will be understood that no general

dock, it being understood that all changes were to be made without in any way interfering with the operation of the works.

The plans were completed and work first commenced upon the main sub-station followed by the conduit and cables for distribution to, and the construction of, the minor sub-stations. All of this work was practically completed by the time the floating dock referred to was delivered at the yard, and the first application of electricity was to the pumping of this dock, about Feb. 1, 1909.

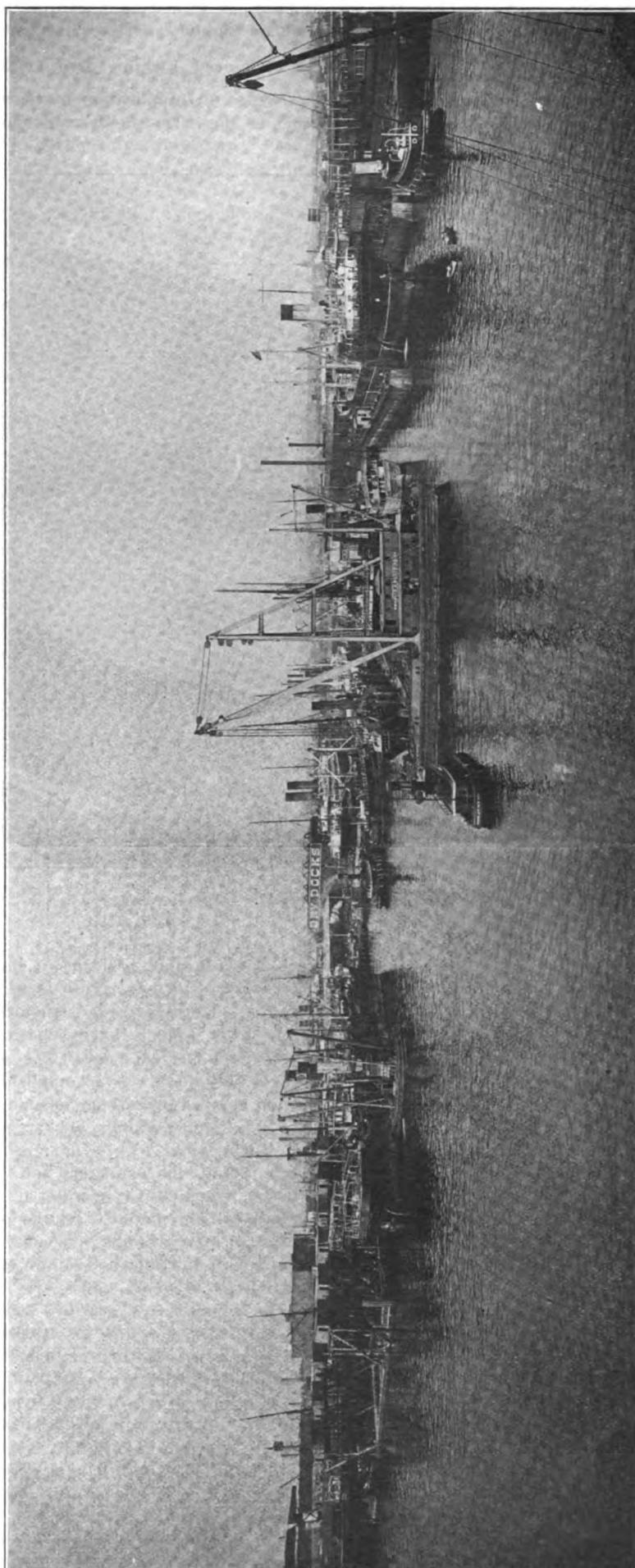
Six-thousand-Ton Pontoon Floating Dry Dock.

This dock has a length in the wings of 335 ft., a width over all of 100 ft. and a depth of pontoon of 11 ft. The maximum net lifting power is 6,000 tons, raising a vessel of approximately 400 ft. in length. The lifting power is the combined buoyancy of 10 pontoons, all separate floating structures mechanically united together by the steel wings or side walls. For pumping this dock there are ten 12-in. centrifugal pumps on each side of the dock. Each set of pumps is operated by a 300-horsepower electric motor through a horizontal line shaft, miter gearing and vertical shafts to the pumps located at the bottom of each end of each pontoon. These pumps deliver the water against a maximum head of 15 feet. The motors operate at 485 revolutions per minute and the line shaft and pumps at 250 revolutions per minute.

Operation of 6,000-Ton Dry Dock.

The operation of the pumping machinery is controlled from sub-station No. 3, located on the pier within about 20 ft. of the point where the dock master stands, and that as soon as the vessel is properly located, the signal is given for starting the motors. The controllers for these motors are of such construction as to obtain a wide variation of speed, ranging from 10 per cent up to the full speed. The secondary circuits from the armatures are conducted from the floating dry dock through flexible connections to the pier and to the sub-station, a distance of approximately 200 ft. The contact levers for the controllers are of the laminated pressure type with carbon break and the main circuit is supplied with oil switches and time relay circuit breaker. The resistance used is of the standard cast iron grid type and of such an amount as to allow the motors to be operated continuously at any speed.

This sub-station is located in the



GENERAL VIEW OF THE YARD OF THE JOHN N. ROBINS CO.

same building as the one for the balanced dock, sub-station No. 4, and that while separate transformers are provided for each dock, provision is made for the cross connection of the transformers so that either bank may be

unfamiliar with its application, the result is highly satisfactory.

Balanced Floating Dry Dock.

The second application of electricity was to the 4,000-ton balanced floating

vessel. The motors operate at 450 volts, 470 revolutions full load and are controlled by drum controllers and resistances in the armature circuit to give variable speed.

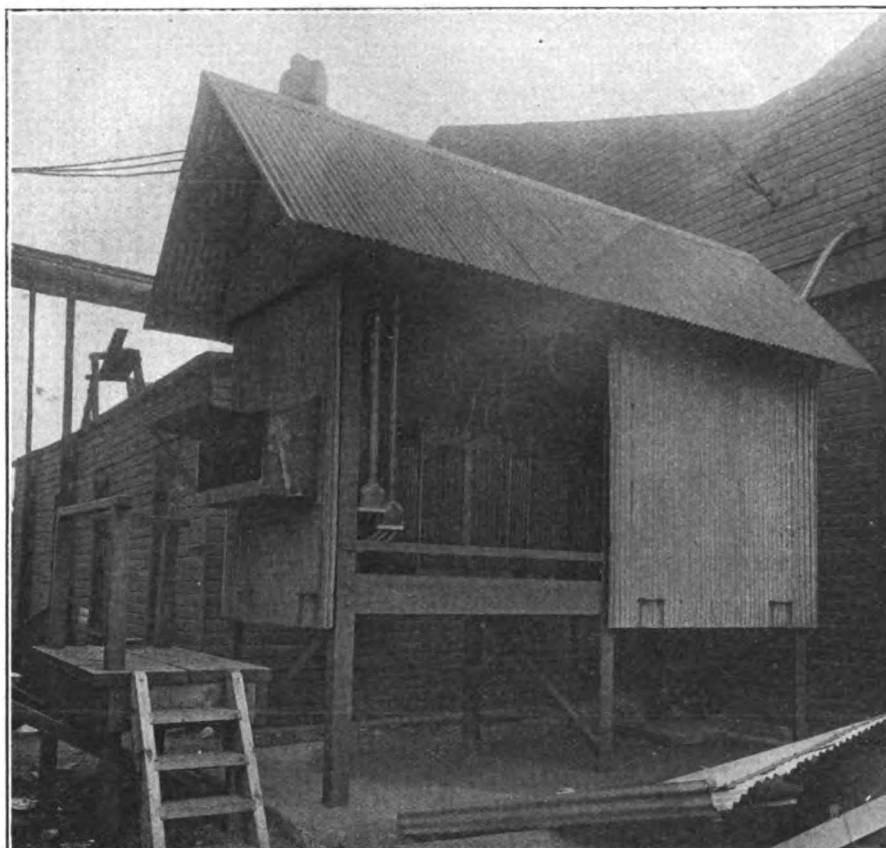
As previously stated, the current for these motors is supplied by transformers from transformer station No. 4. The operation of the dock with these motors has been entirely satisfactory from the beginning. Their application has resulted in the removal of a considerable fire risk and a very considerable weight of boilers, engines and fuel. The time required to pump the dock is about 1½ hours. These motors were manufactured by the Wagner Electric Mfg. Co. and the controllers by the Westinghouse Electric & Mfg. Co.

Air Compressing Plant.

The next application of electricity was to an entirely new air compressing plant, replacing the steam driven machines previously used, which were of early design and low economy. By referring to plan it will be seen that the new air compressing plant is located at a central point for the purpose of reducing air distribution losses all possible.

This plant, which is one of the first large compressed air plants to be driven by high tension electricity, deserves careful consideration. It is composed of two units of 2,000 cubic feet capacity per minute each. These machines operate at 145 revolutions per minute, the operation being by direct connected 6,600 volt electric motors. Each unit requires 360 horsepower at full load. These motors and controllers were designed and installed by the Western Electric Co. The air compressors are of the piston inlet, hurricane-valve type manufactured by the Ingersoll-Rand Co. The low pressure cylinder is 27½ ins. and the high pressure cylinder 15¼ ins. diameter with a stroke of 24 ins. To insure clean dry air, the intake was carried up through the roof, the air entering through a hooded and screened ventilator cap. An 8-in. high pressure discharge runs from each machine independently to a receiving and cooling tank on the outside of the building. The air leaves this tank near the bottom by two 8-in. mains for distribution underground to the various docks and shops.

A new and ingenious method of air unloading was used for the first time on these machines. A series of small air tanks or receivers proportioned relatively to the volume of the cylinder and so connected to the delivery



TRANSFORMER CABIN AND SWITCH BOX IN YARD.

used to operate either dock, as a provision against break-down.

The electric motors were manufactured and installed by the Western Electric Co.; the controllers were manufactured by the Cutler-Hammer Mfg. Co. and the transformers by the Western Electric Co.

The full capacity of the dock can be pumped in from 25 to 35 minutes, requiring the handling of approximately 10,000 tons of water. This dock was put into commission about the first of February, 1909, and from the first has continued to operate in a most satisfactory manner.

The control of the pumping machinery on both sides of the dock by one man, located so as to be most readily directed by the dock master, has proved to be a very great advance over anything heretofore accomplished. When it is taken into consideration that this was the first introduction of electricity in this plant and that the operation was by workmen entirely

dry dock, located adjacent to the one previously described. This dock is one of the oldest floating structures in New York harbor, having been built more than 50 years ago. The pumping of this dock was accomplished by steam engines operating, through gearing, six single-acting, bucket pumps on each wing. These pumps were each 36-in. in diameter and 30-in. stroke, designed to operate at about 22 strokes per minute. As the pumps were of very ample capacity and simple construction, it was not deemed necessary to change them.

The boilers and engines were removed and replaced by two 100-horsepower electric motors on each wing, each motor driving a group of three pumps, and as it had been customary for the dock master to control this dock from the deck of the vessel being raised, the controllers were placed upon the dock, the motors on each wing being under control of a separate operator who could readily be directed by the dock master on board

valve of the cylinder as to be thrown into connection therewith by automatic action of the controller, increases the volume of the cylinder clearance and thus reduces the amount of air delivered.

From the starting up of these machines, not the slightest trouble or interruption has been experienced with the electrical operation and in many

sideration, the two docks situated side by side were served by one set of pumping machinery, located in the pump house shown in Fig. 1.

The steam pumping plant consisted of a compound marine type engine driving, through gearing, two 30-in. centrifugal pumps and occupied the entire pump house. The new plans provided for installing the pumps in

Basin docks are never entirely watertight and a pair of these docks, such as are here shown, requires a 12-in. centrifugal pump to be almost in constant operation.

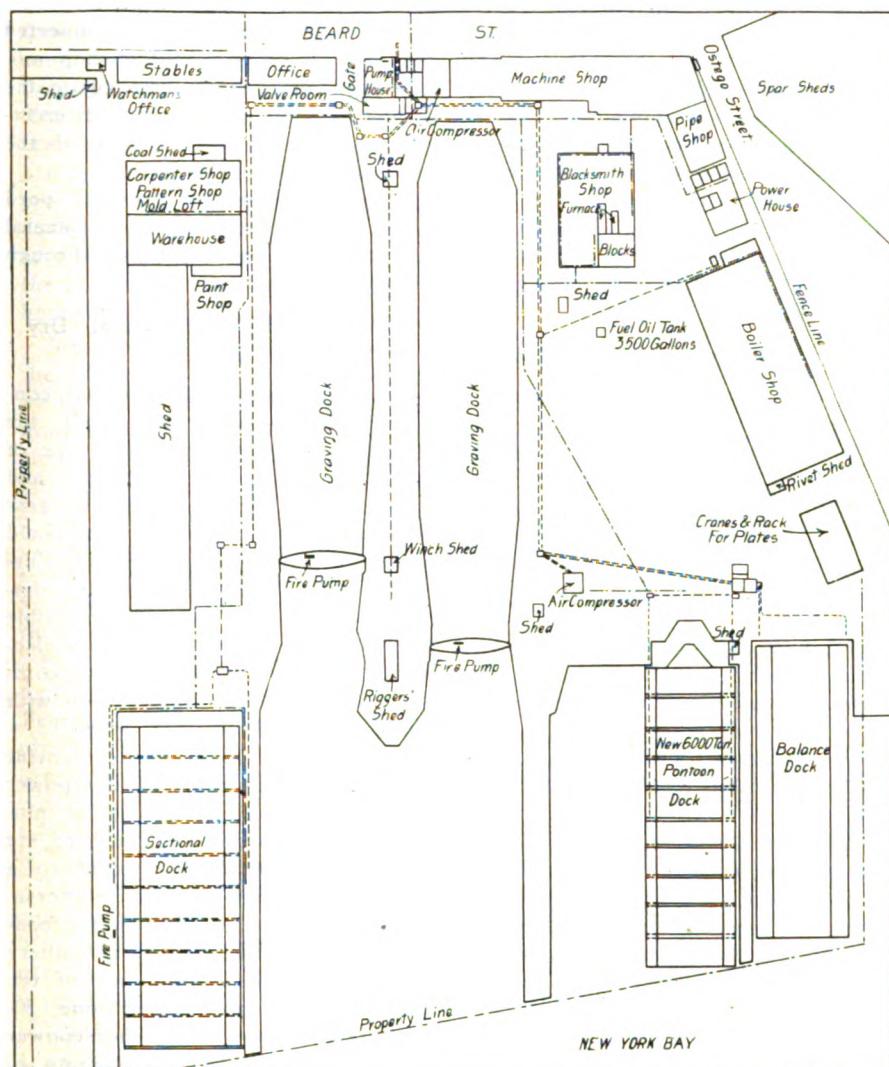
The pumps were installed below low water level and considerable difficulty was encountered in the construction of proper reinforced concrete foundations for such heavy machinery. The floor of the valve room is of steel I-beams overlaid with iron plates in such a manner that both plates and I-beams may be removed to a sufficient extent to handle all machinery and fittings placed in the well. This is facilitated by the heavy I-beam construction of the motor room floor, the lower flanges of which provide a ready means for attaching hoisting tackle.

The motor room floor is of steel and concrete construction, the two 350-horsepower motors being carried on two 24-in. I-beams and the rest of the floor supported by 18-in. I-beams. The walls are of hard brick 20 ins. thick, laid in cement. This construction has resulted in a perfectly steady motor room with two 350-horsepower motors operating at 375 revolutions per minute. The 50-horsepower drainage motor runs at 500 revolutions per minute. The armatures and vertical shafts of these motors are carried on ball bearings at the upper end of the shaft. Flexible couplings are introduced just above the pumps which are provided with independent water cooled thrust bearings.

Electrical Equipment of Graving Dock Pumps.

As previously stated, the two larger motors operate at 6,600 volts; oil switches are used and the multiple switch starters are provided with resistance for starting only and so arranged by interlocking, that the main switch cannot be closed for starting unless all the resistance is in the armature circuit; any desired control of the pump being obtained by closing the delivery gate valve from the pumps. In fact, positive instructions were given to always start up the pumps with the delivery valves closed, which has the effect of starting under a friction load only, the load being gradually added as the delivery valve is opened.

While these pumps must work against a maximum head of nearly 40 ft., the pumping commences against zero head or with the level of water inside and outside of the basin, the same. It should also be understood that in handling water with centrifu-



GENERAL PLAN OF THE YARD.

occasions they have run from week-end to week-end without shutting down. Provision was made in the design for the use of either salt or fresh water for air cooling, and for hauling the salt water circulation a 2-in. centrifugal pump was provided, driven by a belt from the main shaft of the machine.

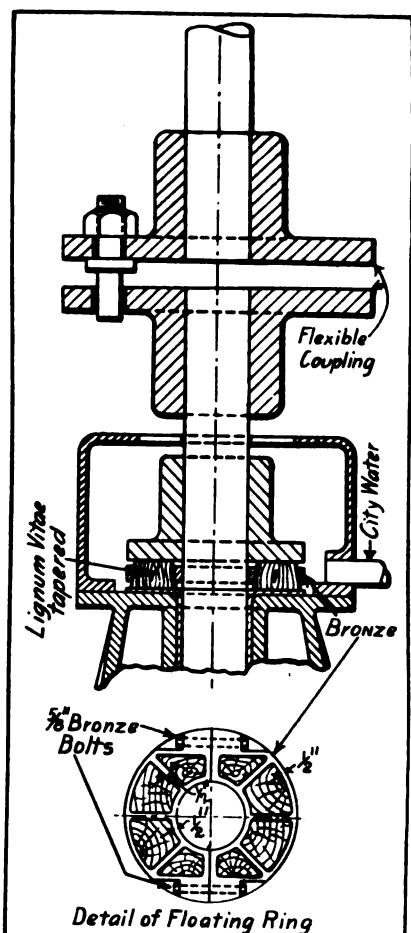
Graving Dock Pumping Plant.

It will be readily understood that with proper conduits or underground connections, more than one basin dock may be pumped by the same machinery. In the case under con-

the upper part of the well, handling the valves in what had been the former valve room and for placing the motors one story above ground over the valve room. To accomplish this, it was necessary to make a connection to the 30-in. vertical suction below the horizontal connection to the old pumps. This required a little over two days and was the only interruption during the entire progress of the work.

Besides the two 30-in. pumps referred to a 12-in. drainage pump with connection to both docks and also to the bottom of the well was installed.

gal pumps operated by electric motors, it will be found that the pump will not overload by increase of head but that the paradoxical or opposite result will occur, that is, the motor will unload by the increase of head



DETAIL OF FLOATING RING THROUGH BEARING.

and will overload by a decrease of head.

Directly over the delivery valves from the pumps, a motor overload alarm is located. This is an electric bell arranged to have its circuit closed by an overload relay and will commence ringing as soon as overload takes place. This will occur if the delivery valve is opened too wide when the pumps are first started against a zero or very low head.

The drainage pump motor is operated at 440 volts and at 500 revolutions per minute. Continuous oiling for all these motors is obtained by a pump which circulates oil from a receptacle above the lower bearing through a small pipe to the thrust and upper bearing. The operation of these motors has given perfect satisfaction from the first. Some difficulty was experienced with the thrust bearings of the pumps and it finally appeared that no satisfactory thrust

bearing for pumps operating under similar conditions had been developed. This difficulty was met by designing a floating ring thrust bearing with lignum vitae pins, illustrated in detail in Fig. 3. These rings are made in halves and can readily be replaced when worn. They have now been in operation on the two larger pumps for several months, giving perfect satisfaction and will not require renewal for a long time. Fresh water from city mains is used for cooling while the pumps are in operation. The larger dock requires approximately two hours in pumping out, during which time there is handled approximately $7\frac{1}{2}$ million gallons of water.

The pumps were furnished by the Morris Machine Works, Baldwinsville, N. Y., and the electric motors and controllers by the General Electric Co., Schenectady, N. Y.

Electric Lighting and Shop Motors.

Direct current for lighting this plant is obtained from one 55 kilowatt and one 25-kilowatt generator, which were formerly belt driven from separate steam engines; the present installation provides for driving these generators by motors of 85 and 40 horsepower respectively, through belt connection.

The current for these motors is obtained from a bank of three 50-kilowatt single-phase transformers reducing the voltage from 6,600 to 440. These transformers also supply current at the same voltage for the shop motors.

There are two constant speed motors for the machine shop, the larger of 50-horsepower belted to the line shaft. The smaller machine shop motor, of 25 horsepower is attached to the ceiling and belted to line shaft.

In connection with the blacksmith shop is a 20-horsepower motor directly connected to a blower. This blower and motor are installed on a concrete foundation protected by a small frame structure located conveniently to the forges.

There is a 10-horsepower motor driving small machinery in the coppersmith shop, also a 60-horsepower motor driving a line shaft in the boiler shop. These motors are operated through a bank of three 50-kilowatt single-phase transformers located in transformer station No. 2, a detached steel structure near the boiler shop.

There is also a carpenter shop motor of 35-horsepower belted to the line shaft and operated from the transformers in transformer station No. 1.

In the shop operation, the policy of

operating the line shaft with motors was adopted rather than that of operating individual machines. The reasons for this practice were not only the great economy in cost of installation, but the fact that in a plant of this kind much of the machinery is operated only at infrequent intervals and that most of the machinery is not readily adapted to the direct application of electricity. The general practice will be adopted of installing new machinery with direct connected motors. In every case the shop motors have either been installed on the ceiling or on a special platform erected so as to be entirely out of the way.

All shop motors are constant speed type, manufactured by the General Electric Co., and operated through General Electric auto starters.

Six-Thousand-Ton Sectional Dry Dock.

This dock is of very unusual construction and operation, being the only remaining example of a type of dock much in use 40 years ago and then known as the Dodge-Burgess sectional floating dry dock, and would require a much more extended illustration and description for its complete understanding than is permissible here and as the application of electricity to this structure is not complete, a more detailed description with illustrations will be given later.

Generally speaking, the equipment is to consist of twenty 20-horsepower motors and two 50-horsepower motors. The 20-horsepower motors are each to be directly connected to a centrifugal pump and the 50-horsepower motors to mechanism for controlling ballast tanks. The machinery will be operated in two sets of ten 20-horsepower motors and one 50-horsepower motor, the 50-horsepower motor being arranged to operate in either direction. In connection with the 20-horsepower motors, there is a special controller system which permits of the ten motors in each group being started, stopped or operated from a master controller, and it will also be possible to operate the motors at three different speeds, it being understood that it is required to operate all the motors at the same speed but to vary the speed of the whole group.

General Observations and Conclusion.

There is now installed and in operation 2,774 horsepower of motors. The total current consumption for the month of May, 1910, was 263,200 kilowatt hours and it is interesting in

an installation of this kind to learn from the recording wattmeters on the main switchboard, the distribution of this power.

The list is headed by the air compressors, which have a combined consumption of 67.1 per cent of all the power used. Transformer station No. 1 supplied current for the lighting dynamos and machine shop motors and shows a consumption of 9.48 per cent. The two large basin dock motors come next with a consumption of 95.2 per cent, followed by the small dock drainage motor with 7.36 per cent. Transformer station No. 2, supplying the boiler shop, copper shop and blacksmith shop motors, takes 3.54 per cent of the current. The new dock, with two 300-horsepower motors, consumes only 1.56 per cent and the balanced dock, with four 100-horsepower motors, 1.44 per cent.

Attention is called to the fact that the 50-horsepower motor running nearly constant on the basin dock drainage, consumes almost as much current as the two 350-horsepower motors used in pumping these docks.

The new 6,000-ton pontoon dock has a capacity almost as large as one of the basin docks and handles more vessels than either, but requires less than 1/5 of the power to operate it.

Since the introduction of the high tension electricity into the yard in February, 1909, the main switch supplying the high tension current has been thrown out but once by a short circuit caused by the closing, by mistake, of a switch on a dead-end cable which had been sealed over the end when pulled in and not protected when connected to the switchboard. This caused an interruption in the current for about one hour.

While there is a total installation of 2,774 horsepower, it has been found practicable to work with a maximum demand of 1,200 kilowatts, a figure which was arrived at at the time the contract for current was arranged, it being understood, of course, that maximum demand influences the cost of current. It is practically certain that if this works was operating from its own electric generating plant, that the installation would have to be very much greater: in all probability not less than 2,500 kilowatts, to allow for spare boilers and generators and the unwillingness of the different departments to handle the work so as to keep down the maximum load.

By the terms of the present contract, any amount of power is available to meet a necessity, but it is distinctly understood that a study of

its distribution will mean a saving and directly effect the earnings of the company.

A daily record of the wattmeter readings is kept and checked with the monthly bills from the central station meters. The positive knowledge of the cost of power and its distribution is of very great value to the accounting department of the business.

The elimination of coal handling and maintenance of steam boilers and furnaces has greatly simplified the operation of the plant.

An unlimited amount of power available at any hour of day or night by simply closing a switch, is an ad-

vantage which cannot be over-estimated.

It should be understood that in ship repair work, the utmost dispatch and promptness in executing work is the first consideration. In October, 1909, the Steamer Howard was put into basin dock No. 1, cut in two, the forward section moved 40 ft. and this space built in with frames, plating and all interior work, made watertight and the ship left the dry dock in 14 days. This was only accomplished by working every man available day and night and during this time the air compressors and much other machinery in the shops never stopped.

Modern Shop Methods

BY F. W. BECKER.¹

MUCH has been said about economical methods in up-to-date shop practice and many systems have been tried. In fact some shop organizations are so full of systems that the product actually suffers in the misdirected efforts to nurse the divers schemes along. It is just as difficult to make any system to fit all conditions as it is to provide a medicine to cure all ills—the effect of either when used is above the same. In order to intelligently find the proper remedy you must first determine the disease, and then to apply a cure will be simple.

I want to show in this as well as in succeeding articles that system is the result of close observation of existing conditions with a little common sense applied to remedy defects.

The writer served as an apprentice in the United States navy, where a large portion of time was spent in leisure by the crew. During this idle time an occasional job would spring up requiring certain number of hands from each part of the ship. These jobs rarely have any supervision, and are completed quickly and with the least possible effort. The reason no wasted energy is expended or false moves made is due entirely to the fact that certain specific work is laid out which is performed on what the operators believe is their own time and consequently their own interests are at stake.

Coaling ship in our navy is considered hard work from which few

are excused and in the beginning of this task the snaps or easy positions are quickly covered by those reaching the stations first, and by so doing claim the right to the position. This claim is usually allowed to stand. Under such conditions the least apt is likely to get the heavier and often the most important duty, which may arrest the progress of work. While the work was under way the commanding officer of the vessel sent word that shore leave would be granted soon after the last bag of 1,000 tons came on board. The desired effect was immediately apparent. As much coal was handled in four hours thereafter, as was previously in ten hours. This increased efficiency was not due to an extra spurt as much as it was to the sudden awakening of those connected with the job that held positions but did no work. It was the result of every man voluntarily getting into line where he could do the most good and I doubt whether a game of checkers could be better played, and the points of vantage better occupied. I am positive no prepared system could have accomplished the same result. There is no science required in putting a man where he belongs.

Effect of Promised Short Leave.

I for one was very much pleased with the arrangement brought about by promise of shore leave. It did not increase my duty or that of many others who were doing their share of work. On the other hand the burden was now so equally divided with each man in a position best suited to his

¹Assistant shop superintendent Mare Island navy yard.

ability, that the work became light and interesting.

We may not have any further inducements to offer in manufacturing shop practice than the regular weekly wage and an occasional promotion, but no one will object to work under a system in which each man is compelled to carry his share of burden, thereby equalizing the load to be carried by all concerned in the task. The only man that such a system will not appeal to, is the man who is after a position, but not work. Any organization is better off without this kind of material.

If you want to find this kind of timber in your force put him in the center of your line of producers with good men around him. He will soon quit or keep step with the procession.

Operations should be so arranged that one machine is dependent upon another of like capacity.

Arrangement of Work.

Hand or bench work should be arranged according to time required to complete operations. If it requires two men to keep the next man going, get the two men, but know for yourself that two men are required, by all means. Keep the procession moving and you will soon find the flatfooted members that can't march.

Consider that a large battleship can be cleared of all movable objects, dismantled and made ready for action with tons of ammunition hoisted on deck, in less than five minutes. You would not look for leaks in any such an operation because it would be clear to you that every move made accomplished something. Can't you apply some of this in your shop practice? You say the men are drilled. If necessary drill yours! I will try to show later how they can be drilled to advantage.

Anyone entering the navy soon becomes acquainted with the "Lucky bag." This bag contains everything that is picked up by the chief of police of the ship, found out of place, and is later sold at auction.

The owner of articles in the "Lucky bag" has his choice of either buying his own goods, or claiming them without price, but is punished for delinquency. When you consider the machine hours lost in hunting for things that ought to be in their place, don't you feel like installing a "lucky bag?" or at least of establishing the rules of "a place for everything and everything in its place." This subject will be taken up in succeeding articles.

In the meantime look for leaks and stop crowding the men or expecting them to do more than a reasonable

day's work. Any system designed to do this will live but a short time. By careful, intelligent selection of material for shop organization it is possible to develop and train an efficient force, without creating the ill feeling that elimination engenders.

The Selection of Help.

The important task of selecting your help must be given to a man of superior judgment. It is no easy matter to hire the man you want, and it is a very easy matter to employ the man you don't want. We have all met the professional job hunter, who is forever representing himself to be the very thing he isn't.

Did you ever note the bundle of references this fellow carries? Everybody he ever worked for declares what a good man he would make for some other concern. I, for one, do not place too much weight on references. A former employer is apt to feel disgruntled if a desirable employee voluntarily resigns and what he will say concerning the applicant may not assist you in determining his fitness for your work. It is important to know whether he was honest; it is important also to know how he feels towards his former employer. A real good man will have no grievance against an old employer. A poor man is always ready to pour out his tale to any one who will listen.

A shrewd employer may prove or disprove statements made in questioning applicants concerning their past experience and methods, but has the applicant the necessary capacity to adapt himself to your kind of work?

After the construction of a large foundry and machine shop the writer was detailed in organizing the shop force, which required the services of about 800 operators. The plant was well located near a convenient labor market and applicants were numerous. In fact a police officer was regularly stationed to keep the passage clear.

To the casual observer one would think most any kind of position could be filled from such a number, when as a matter of fact few could be used. Few possessed both character and skill.

Have you ever visited a kindergarten? Did you ever notice the youngsters straightening out a mess of colored yarn or piling blocks in order or engaged in a hundred other apparently worthless jobs? If you have not, do so. It may teach even you something. You will see the different methods employed and the little brains working in cleaning up their tasks.

These little minds are free and bent

on accomplishing the tasks set for them, some go about their duty of building up and straightening out, only to have the whole thing collapse or tangled in a worse mess. Others are more systematic, separating carefully and building the pyramids sufficiently large to avoid collapse. Is it difficult to select from this class of children, the brighter and most apt? I think not! I have applied some of the principles learned from the children in recruiting the working force, which will be taken up in the succeeding articles.

Steamer for Honolulu

The Union Iron Works, San Francisco, has secured the contract from the Interisland Steam Navigation Co., of Honolulu, for the construction of a new steel steamer to be used between Honolulu and Hilo and other intermediate island ports. The vessel will cost \$336,000. Work will be started at once at the South San Francisco works of the company. James Kennedy, president of the steamship company, who was in the city recently, closed the contract.

The steamer is to be completed in December of this year, and will be 240 ft. long, 36 ft. beam, 19 ft. deep with a mean draught of 16 ft. She will have a speed of 14½ knots with a cargo capacity of 1,000 tons dead weight. There will be 34 first class staterooms fitted with two berths each, and the equipment will be thoroughly up to date in every particular. The steamer will have a four-cylinder, triple-expansion engine capable of developing 2,400 H. P. and four Scotch boilers.

Obituary

Thomas Warren, a member of the firm of Howard H. Baker & Co., ship chandlers, Buffalo, N. Y., died after a prolonged illness at Bridgeburg, Can., Jan. 14, 1911, at the age of 74 years. Mr. Warren had been identified with the above named firm since 1863, or nearly half a century, and was well known by hosts of friends along the great lakes, who will remember him as a genial, dignified, kind-hearted business man of the strictest integrity. He will be sadly missed from his accustomed place in the old store, where he had so long filled an important position of trust and confidence.

THE MARINE REVIEW will extend the subscription for six months of any subscriber who can supply it with a copy of the July, 1909, issue.

SEA WALL AND WHARF CONSTRUCTION AT SAN FRANCISCO

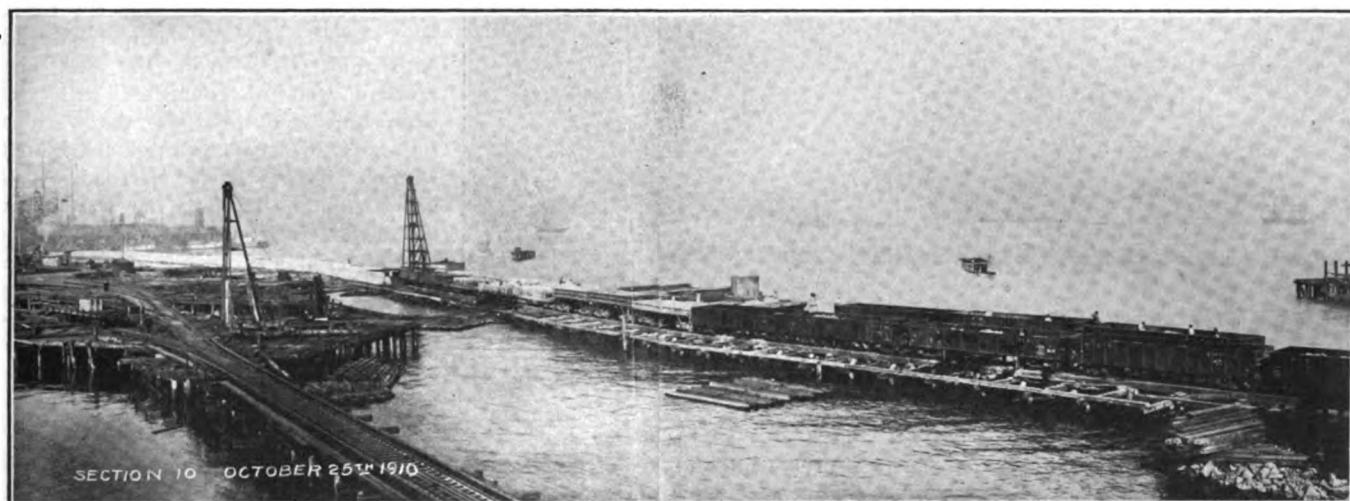
IN THE MARINE REVIEW of July, 1910, the new concrete piers, 38 and 40, in the harbor of San Francisco were described. Mention was also made of the permanent concrete sea wall construction being placed back of these piers and along the entire waterfront. The water

piles, and having a rock fill below and on both sides of it. The base of the concrete is 30 ft. below city datum.

Section 8 is designed to support building additional ferry facilities and to afford a base for additional slips, and for this reason no bulkhead wharf is placed upon it. A cross section of the wall shows the top at city elevation, zero, with a width of 3 ft. The back of the wall is perpendicular and

tending below the rock fill, to protect them from the teredo, 42-ft. fender piles backed with car springs and 4 by 16-in. ribbing, are placed just outside the waterfront line.

In connection with the work on the new wharf construction, and relative tests of wood and concrete piles, Mr. Barker, assistant state engineer, has completed some very extensive tests on the value of the eucalyptus trees



SECTION 10 OCTOBER 25TH 1910
SECTION 10 OF THE CONCRETE SEA WALL BEING CONSTRUCTED ALONG THE WATER FRONT OF SAN FRANCISCO BAY. ALL PILING AND OLD WHARVES ARE BEING REMOVED AND THE AREA BACK OF THE SEA WALL FILLED IN TO FORM SEA WALL LOTS.

front line of San Francisco, under the jurisdiction of the Board of State Harbor Commissioners, is approximately 8 miles in length. On June 30, 1910, there were in existence along this line, 41,700.5 ft. of completed seawall and 23 seawall lots. By the construction of a new seawall and the reclamation of the land between it and the previously existing city front the property area is gradually increased.

During the last two years the construction of new seawall has been prosecuted as rapidly as the conditions would permit. Three sections are now under construction. The design being used on the last three is a departure from that previously used. The original wall construction consisted of a broken stone core, topped with rubble masonry above the water line. This has been found to be somewhat unsatisfactory, as it allowed of the tide to flow through and carry away the fill behind the wall.

The new seawall construction consists of a concrete wall, supported on

extends to a depth of 30 ft., where the base measures 30 ft. Four rows of piles spaced 2½ ft. centers support the base. Back of the wall a rock fill with a natural slope covers the lower 8 ft. of the wall. On the outside of the wall a rock embankment with a 30-degree slope is brought up to the base of the wall and 22 ft. in front of it. From this point up to mean low water elevation, a natural slope is given the rock fill, which stops at this point.

Sections 9 and 10 are designed to form the base for piers and have bulkhead wharves upon them. All recent bulkhead construction has been entirely of concrete and steel. These concrete bulkhead wharves built in connection with a solid concrete wall have two decided advantages over the wooden wharves found on the other sections of the waterfront. They are absolutely fireproof and afford no opportunity for vermin to exist. The bulkhead wharves are of concrete built on 20-in. I-beams supported on wooden piles coated with a concrete casing ex-

for piling. A great many claims have been put forward that certain varieties of eucalyptus trees would resist the attacks of the teredo and the limnoria. This claim was made for the blue gum variety, which is quite plentiful in California, and is available in suitable sizes for piling. The State Board of Harbor Commissioners decided to make a test of these trees and about 1,200 were purchased and put into structures where the teredo was known to be active. About 250 of these trees came from the city of Berkley, in Alameda county, where they were planted in 1872 and were therefore 37 years old when cut; the balance came from the Parkside division of San Francisco, and were from 24 to 28 years old. All were of the same variety, i. e. *Eucalyptus globulus*. These piles were driven in 1909, and, although they have not been in service long enough to determine their value fully, they have been found very little better than fir. A large number were used in the construction of one of the ferry slips at

the foot of Market street. It was thought that the wood being tough and strong, would resist the blows and wear of ferry boat service better than fir piling, but the result has been a

take up and push the development of its wharves and waterfront to meet the demands now made upon it by shipping. The character of the carriers employed in coast transportation

schedules and discharged their cargoes in a leisurely way. This did not require piers or a waterfront that could accommodate a large quantity of freight, as it could be hauled away almost as fast as it was received. Now the carriers are principally large steam vessels carrying from 6,000 to 12,000 tons of cargo, and operating on a fixed schedule and are so expensive to operate that their lay-time must be the least possible. Every means of hastening the discharge and taking on of cargo is employed. The result is that an enormous amount of freight is piled upon the piers and wharves and they very soon become congested.

In the rebuilding of the wharves and waterfront these conditions are being met. All piers are being equipped with spur tracks from the belt line railroad, and so connected with the main and spur lines of the various railroads, that cars can be distributed without delay. A 100-ft. roadway is being completed along the waterfront for the use of teams that handle goods and material directly to and from the wharves and warehouses. With the completion of a short stretch now under construction, this roadway will be continuous between China basin, the big freight wharves and the berry building at the foot of Market street.

The average width of the piers in San Francisco harbor is at present about 100 ft. The largest are 140 ft. in width and a few old ones are only 80 ft. The latter are what is left of

SECTION 8 OF THE SEA WALL, SHOWING ROCK EMBANKMENT ON THE SEA SIDE OF THE WALL.

disappointment. The eucalyptus does not stand the wear any better than fir, and does not afford enough rigidity for ferry slip construction on account of the rapid taper and the ease with which the piles are bent.

The eucalyptus tree is not a native of the United States, but has been imported and planted here, and many claims have been advanced, as to its value, but reports from other countries indicate that they are not well founded.

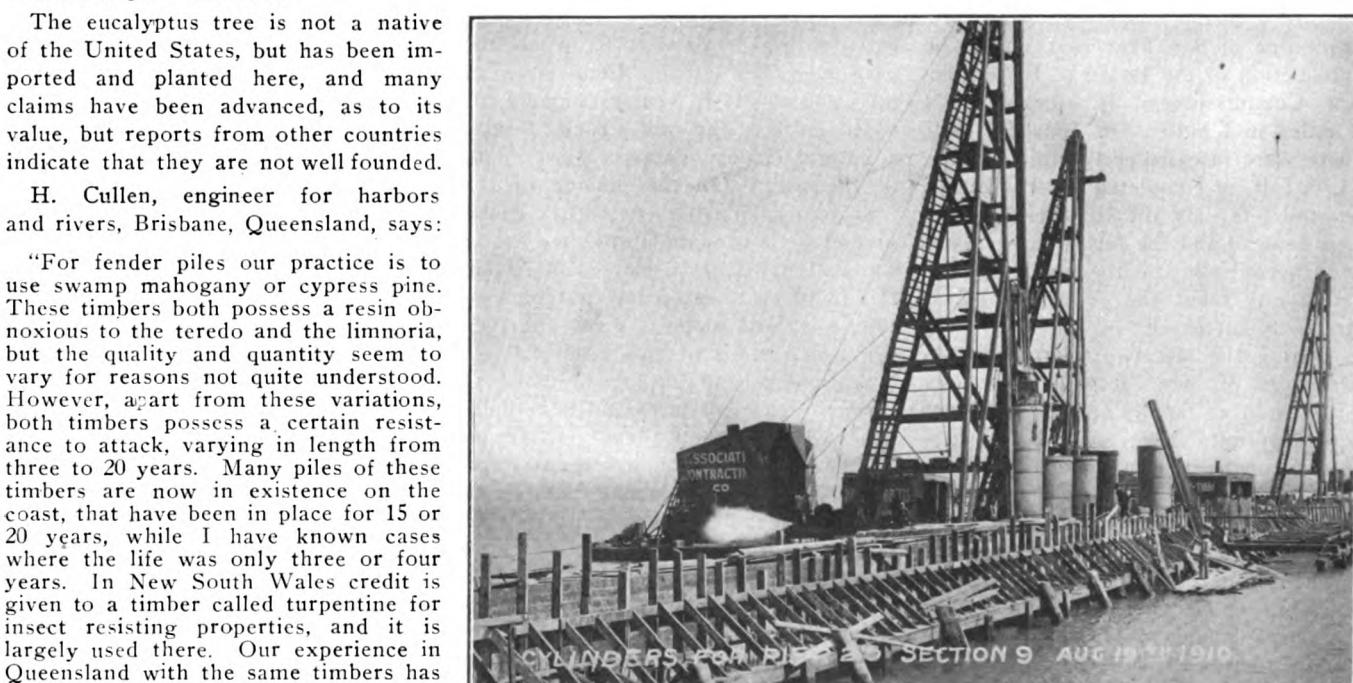
H. Cullen, engineer for harbors and rivers, Brisbane, Queensland, says:

"For fender piles our practice is to use swamp mahogany or cypress pine. These timbers both possess a resin obnoxious to the teredo and the limnoria, but the quality and quantity seem to vary for reasons not quite understood. However, apart from these variations, both timbers possess a certain resistance to attack, varying in length from three to 20 years. Many piles of these timbers are now in existence on the coast, that have been in place for 15 or 20 years, while I have known cases where the life was only three or four years. In New South Wales credit is given to a timber called turpentine for insect resisting properties, and it is largely used there. Our experience in Queensland with the same timbers has not borne out the claims made for it in New South Wales."

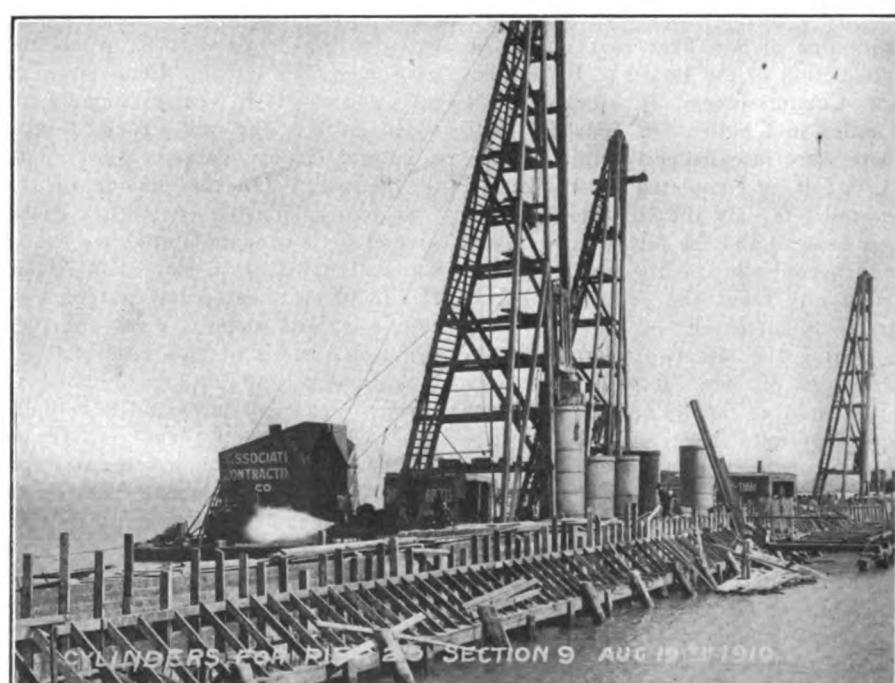
San Francisco is the first of the large seaports on the Pacific coast to

is entirely different from those of a few years ago, when much of the shipping consisted of sailing vessels of comparatively small tonnage.

These did not have any sailing



SECTION 8 OF THE SEA WALL, SHOWING ROCK EMBANKMENT ON THE SEA SIDE OF THE WALL.



SHOWING STEEL CASINGS FOR CONCRETE PILES FOR PIER 26. THE STEEL CASINGS ARE REMOVED AFTER THE CONCRETE HAS SET, LEAVING THE WOODEN FORM IN PLACE.

the old construction when large steamers were comparatively scarce in San Francisco trade. The piers now being designed for sections 9 and 10 of the new seawall, are 209 feet in width, with depressed railroad car tracks along the center of each. This will allow sheds 80 ft. in width if two tracks are provided, and 86 ft. if one track is provided, on each side of the track, and will leave 10 ft. between the edge of the pier and the shed.

This will afford facilities for the handling of general cargoes which must be sorted before going into the cars, and cargoes can be placed directly in cars by the ships' tackle, with overhead cranes for handling heavy pieces of cargo. Several of the piers will be provided with outside trackage, so that cargoes can be handled directly into the ship's holds. The space between the piers along the seawall is being increased to meet the demands of the larger ships, and in the new piers, the width of the slips will be 220 ft.

Pier 36, recently completed, is of the same general construction of piers 38 and 40 previously described out to the nose of the ferry slip; from that point it is of wood construction. It is provided with a ferry slip and apron for handling freight cars. The outer end of pier 36 was built of wood to better absorb the shock of incoming car floats and ferry boats. On one side of the pier is a shed, a railroad track; between the shed and the edge of the pier the other side is open and provided with trackage.

Pier 54, just completed, is entirely of reinforced concrete except the shed, which is of wood.

It has a depressed track on one side. In floor space it is the largest pier on the San Francisco waterfront, measuring 780 ft. in length and 140 ft. in width. Pier 54 is located at the farther end of the waterfront roadway, being adjacent to the trackage systems of the San Francisco and San Joaquin Railroad Co.

The action and work of San Francisco in improving and building permanent seawalls and fireproof concrete piers is being watched very closely by the other seaport towns on the Pacific coast. That the value of substantial improvements is being recognized and acted upon is apparent from the steps taken by Portland and Tacoma, in beginning the construction of public docks and wharves.

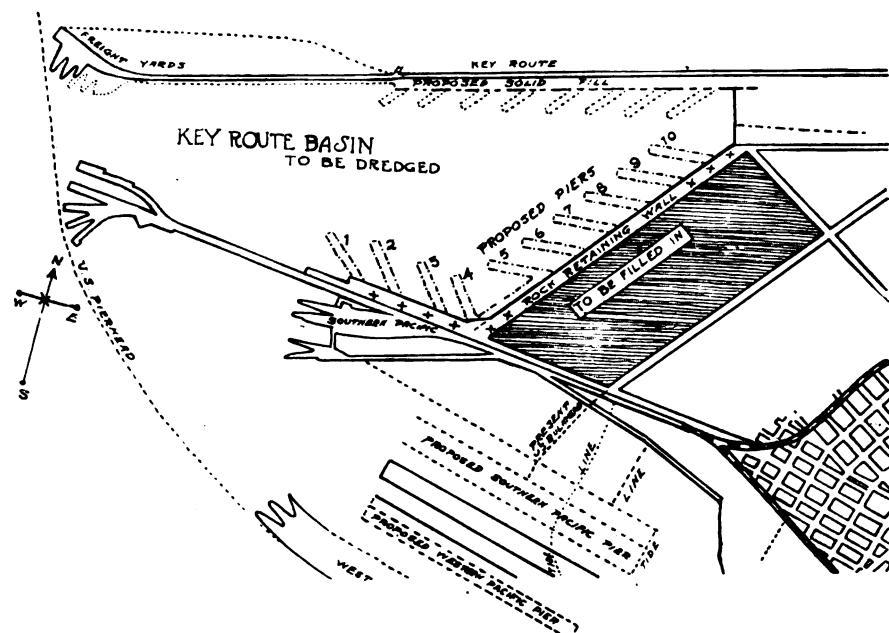
Developing Inner Harbor at Oakland

Work on a great inland harbor, which promises to be one of the great-

est municipal shipping projects in the United States, was started by the city of Oakland, Cal., on Dec. 14, when the board of public works of that city let the contract for the construction of the rock retaining wall along the new bulkhead line which is to serve as a quay in the Key Route Basin, and will be the outer margin of 400 acres of land, which is to be filled in by the city. The amount of the initial contract was \$47,450. The estimates of the city engineer call for an expendi-

ture of water front land. The city is required by the war department to start the work within one year and to have it completed within six years. Col. John Biddle, chief engineer officer of the department of California, in charge of river and harbor work, has given the plans his approval and it was on his recommendation that the city received permission to carry on the work.

The Southern Pacific Co. has its engineers at work on plans for the erec-



MAP OF THE PROJECTED IMPROVEMENTS ALONG THE WESTERN WATER FRONT OF OAKLAND.

ture of \$350,000. In addition to this amount the Key Route Co. is preparing to expend \$500,000 as its share of the development of the harbor.

The Key Route Basin will be dredged to a minimum depth of 30 feet along the entire frontage of 7,000 feet, which is to be the length of the proposed quay wall. The quay will be owned absolutely by the City of Oakland, and the structure will be built so that the frontage can be more than trebled, by the construction of piers, as fast as the room is needed. The land back of the wall will be platted and streets cut through, giving easy access to the warehouse and business district of the city. It is estimated that the value of the land thus reclaimed will be about \$6,000,000.

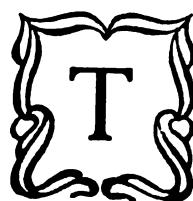
The development of the basin as planned by the city is in strict accordance with the requirements laid down by the war department. The department has given the city permission to fill out to a point 2,000 feet west of the old bulkhead line, thus making possible the creation of the 400 acres

of a series of wharves, which will provide berthing facilities for a large number of vessels, and the Western Pacific Company has plans for the extension of its water front facilities. The improvements will mean much to the City of Oakland, and will give that city unsurpassed facilities for handling overland freight direct to the largest vessels plying the Pacific.

All of the railroads involved in the improvement have secured franchises from the city for their share of the work, and will commence work as fast as sufficient work is completed to insure their work being of a permanent character. Col. W. H. Huer, consulting engineer for the city, is overseeing the work, the plans for which are the work of City Engineer Turner.

The initial contract for the retaining wall was let to the San Francisco Quarries Co., who will commence work at once. The money for the work was secured by a recent bond issue, which the city floated without difficulty, and the actual cash is now on hand to be used as the work progresses.

GREAT LAKES PROTECTIVE ASSOCIATION



HE second annual meeting of the Great Lakes Protective Association was held at the Hotel Ponchartrain, Detroit, on Jan. 18, immediately preceding

the annual meeting of the Lake Carriers' Association. The protective association was organized two years ago to inquire into the causes of the numerous accidents that were occurring on the great lakes and to seek the remedy. The association decided to carry 5 per cent of its own insurance as an earnest of its intention to, if possible, lessen the number of accidents by removing their causes. The insurance premiums were gradually becoming prohibitive but the insurance companies maintained that they were making no money in lake business and the returns of the Great Lakes Protective Association indicate that they were not. The report of J. S. Ashley, chairman of the advisory committee of the Great Lakes Protective Association, shows that for the year 1909 the association lost \$8,111.95, which, of course, is only one-twentieth of the sum lost by the underwriters during that year. The premium for 1909 was 5 per cent, upon which the underwriters lost \$160,000. The premium for 1910 was placed at 6 per cent, but as all the policies have not yet expired it is not known whether the underwriters made money at that figure. The report of Mr. Ashley was a model of simplicity and clearness. He said:

The rate of premium established by the underwriters for straight hull insurance for the season of 1910 was 6 per cent, an advance of 1 per cent over that obtaining in 1909. Your advisory committee objected to this radical increase in insurance rates but was unable to convince the underwriters that the charge was unwarranted. A proposition was then made to the underwriters that they return 1 per cent of the premium paid on every vessel making no claim against the underwriters under its 1910 policies. This the underwriters refused, but intimated that they might consider, if agreeable to the association, a proposition to return 10 per cent of the net earned premium for no claim upon the provision that one-quarter of the amount returned should be given as a bonus to the master bringing his vessel through without a claim.

As many complications would enter into the question of the payment of such a bonus to the masters, your advisory committee, after considerable

discussion of the subject, adopted the following resolution:

RESOLVED, That in cases where no claim is made under the policy a refund of 1 per cent in premium be returned, three-fourths thereof to go to the owner, the remaining one-fourth to go to the treasurer of the Great Lakes Protective Association for distribution to the executive officers of the ships under the rules and direction of the advisory committee, and where thereunder any portion of the one-quarter is withheld from any officer it shall go into a fund for aids to navigation and similar work under the direction of the advisory committee.

This proposition was not acceptable to the underwriters but an agreement was finally reached with them under which they agreed to return 10 per cent of the net premiums in case of no claims, 75 per cent of which rebate was to go to the owner of the vessel, and 25 per cent returned to the advisory committee for payment to the master of the vessel.

Surveyor's Fees and Expenses.

During 1909 the underwriters objected to including in the adjustments the fees and expenses of the owner's surveyor, and the following clause was inserted in the 1910 policies:

"It is understood and agreed that the fees and expenses of the assured, his superintendent, the officers' manager, and or his other servants are not collectible under this policy."

This question was taken up at meetings of your advisory committee and after a discussion of the subject the following resolution was adopted:

RESOLVED, That this association recognizes the fact that ship owners have the right to have a representative on all surveys of damages to their ships and also to have such damages repaired under the supervision of their representative, and that all proper fees and expenses of such representative for such surveys and superintendence should be included as a proper charge in the adjustments, provided, however:

That when owners choose to perform this service themselves or to have it performed by a salaried employee no fee shall be charged, but only reasonable expenses.

Moreover, that the association also recognizes the right of owners under the Sue and Labor clause to send a representative to superintend the releasing and recovery of their ships when in trouble and that the fees and expenses of such representative are a proper charge under the policy, provided, however:

That when owners choose to perform this service themselves or to have it performed by a salaried employee no fee shall be charged, but only reasonable expenses.

A clause had been inserted in the insurance policies for 1910 prohibiting winter mooring, except upon the pay-

ment of extra insurance, under the Buffalo breakwater but the protective association was able to have this set aside under defined rules for mooring. Continuing, Mr. Ashley says:

Insurance under 1910 policies terminated on Nov. 30 at midnight. Several meetings of your advisory committee were held upon the eve of this date for the purpose of considering the question of extension, and your committee recommended that as the United States government had decided to discontinue the majority of aids to navigation on Dec. 5 and the storm signals on Dec. 6, extensions of insurance beyond midnight of Nov. 30 should not be granted.

Your committee's action in this matter, however, was not concurred in by the other underwriters and thirteen extensions were granted beyond that date, at a rate of 1 per cent and for which the underwriters received gross premiums of \$21,719. The wisdom of the position of your committee is demonstrated by the fact that two disasters occurred to vessels sailing on these special trips, one to steamer Dunelm, stranding in Lake Superior, and one to steamer F. B. Squire, grounding at Ballard's reef. The estimated cost to underwriters by reason of these accidents is \$65,000, making a loss of about \$43,000 more than the gross premiums.

Water Draughts.

Careful observation was continued during the past year of the depths to which vessels passing through the canals of the St. Mary's river, both up and down bound, were loaded, these vessel draughts being considered in conjunction with the bulletins published by the Lake Carriers' Association at all loading docks for the regulation of depths of loading.

A marked improvement was observed during the past year in the loading of vessels to conform with the recommended draughts, and in cases where vessels were loaded beyond the draughts recommended the excess loading was so slight that but little criticism could be made, although the stages of water during the past year were of a much lower level than prevailed during the season of 1909.

A careful scrutiny has been made of all adjustments during the past season and in every case where there was question as to the propriety of any items charged therein the questionable items have been made matters of investigation and negotiation before the adjustments were approved for settlement.

At the request of the underwriters the association verified all applications for lay up returns, making a special investigation in each case. A uniform rule was adopted providing that a vessel shall be entitled to return premiums when in one port for fifteen consecutive days, and not nav-

igating under her own steam, whether assisted or not, and not undergoing repairs at the underwriters' expense.

As the United States court is crowded and litigation expensive settlements were made out of court whenever possible. All claims of any importance except two were satisfactorily adjusted by the association.

The 1909 account with sixty-two claims unadjusted but carefully estimated the financial statement is as follows:

Total contributions, including extensions, extra trips, etc.	\$207,114.02
Less 10 per cent rebate to subscribers	20,711.40
Balance	\$186,402.62
Less net return premiums paid subscribers	6,331.84
Total net contributions	\$180,070.78
Other Income:	
Interest on deposits	\$1,869.86
Amount received from Associate members as contributions towards expenses of the Association	1,704.89
Total	3,574.75
Total expenses of the Association, including expense of Advisory Committee and compensation of Attorneys-in-Fact, have amounted to	\$183,645.53
Amount available to pay 1909 losses	\$142,444.78
428 disasters have been reported, quite a number of which have proved not to amount to a claim.	
285 claims adjusted and passed to New York for payment	129,166.68
9 claims in general office under investigation	9,406.86
62 claims expected	10,383.25
Allowance to cover claims which may be presented of which we have no advice—legal, fees, etc.	1,600.00
Total claims to be paid	\$150,556.73
Forward	142,444.78
Showing net loss to the association.	\$ 8,111.95

CLASSIFICATION OF ACCIDENTS REPORTED UNDER 1909 POLICIES.

Strandings	54
Groundings	128
Collisions	125
Striking obstructions	25
Striking Locks	5
Boiler damage	2
Fire	3
Striking Bridges, Docks, Breakwaters, Canals, Harbor and Channel Banks	48
Stress of weather	9
Collapsed Deck	2
Machinery damage	12
Cargo Heating	1
Legal Expenses	2
Lost Anchor	1
Ice Damage	1
Salvage Association's Fees	5
Unknown	1
Total Loss	4
Total	428

During 1910 402 contracts covering full form and twenty-one contracts, covering port risk, have been issued to members of the association during the past year. The total amount assumed under these contracts was \$4,218,141, being 5 per cent of the aggregate value of \$84,362,801. This includes practically all of the coarse freight carriers on the great lakes, as most of the Canadian owners, who in 1909 were only entered as associate members, were this year included in

the regular membership of the association.

The contributions of members of the association for 1910-11 are as follows:

Initial contributions	\$248,556.19
Additional contributions for extensions and extra trips	2,385.95
Total	\$250,941.14
Less 10 per cent rebate to subscribers	25,094.13
Leaving net contribution of	\$225,847.01
Less 10 per cent on the gross contribution for the expenses of conducting the Bureau, guaranteeing the solvency of one member to the other and guaranteeing the payment of premium to the Association	25,094.11
Interest received to date	563.78
Leaving a net income of	\$201,316.68
Fourteen claims adjusted and paid	\$39,283.00
Expenses of administration	14,337.80
	53,660.80
Leaving a balance of	\$147,655.88
to pay unadjusted losses and claims made on unexpired policies	

No financial report can be made on 1910, as only 75 per cent of the time of the policies has been worked out. The number of disasters, however, is gratifying as compared with 1909, there having been 312 in 1909 and only 177 to the close of navigation in 1910.

The Canadian members withdrew from the association in 1910, having formed one of their own. This made necessary a slight amendment in the by-laws of the association which was cared for by Harvey D. Goulder, counsel, and Francis King. The Canadian representative was replaced by Charles M. Heald, of Buffalo, on the advisory committee. The members of the advisory committee are: J. S. Ashley, J. H. Sheadle, W. C. Richardson, Harry Coulby, S. P. Shane, W. H. Becker and C. L. Hutchinson, of Cleveland; D. Sullivan, of Chicago; William Livingstone, of Detroit; H. S. Wilkinson, of Syracuse, and C. M. Heald, of Buffalo. At a meeting of the committee held later Mr. Ashley was elected chairman, Harvey D. Goulder counsel, and W. C. Richardson, treasurer.

Mr. Ashley Pleads For Cautious Navigation.

After the conclusion of his report Mr. Ashley made a few extempore remarks, saying:

"That we are accomplishing something is undoubtedly demonstrated by the fact that although during the season of 1910 there were a great many more vessels in commission, consequently much more danger of accidents, than there were in the season of 1909, we show a much smaller number of accidents and, although I

am unable to present you any figures as to how we are going to stand in dollars and cents on our 1910 account, there is no question but what we will show a profit unless we have an unusually large percentage of losses on our unexpired policies. On the other hand we have not accomplished all that we should.

"In 1909 we show conclusively that we lost in the neighborhood of \$8,000, which is one-twentieth of the sum the underwriters lost on vessels in our association. They lost in the neighborhood of \$160,000.

"In 1910 the insurance premium is 1 per cent higher. We do not know how much we are going to get back by reason of rebate for vessels making no claims but up to the close of navigation over 50 per cent of the vessels had not reported any accidents, which would indicate that quite a large amount of premium would be returned.

"That we are not navigating our vessels with the care and caution which we would exercise if not covered by insurance I think is shown by the return of the Pittsburg Steamship Co., operating over 100 vessels, and which has been carrying its own insurance for the last ten years. Their average for the ten years is something like 3½ per cent. Of course we can not expect to reach the results that they obtain because being under so many different managements we have not the same control of our men. They can promulgate rules and carry them out which would not be possible for us to carry out. We should, however, approximate somewhere near the results obtained by the Pittsburg Steamship Co. In other words we should get down the 4½ per cent on our insurance.

"I wish to impress upon every manager the absolute necessity of insisting on the masters being very careful, very conservative in the navigation of their vessels, and to do everything possible, as managers, to help the association reduce this immense volume of losses."

Mr. Coulby's Impressive Talk.

Following Mr. Ashley Mr. Harry Coulby, president of the Pittsburg Steamship Co., made a very impressive address, the keynote of which was personal responsibility, saying:

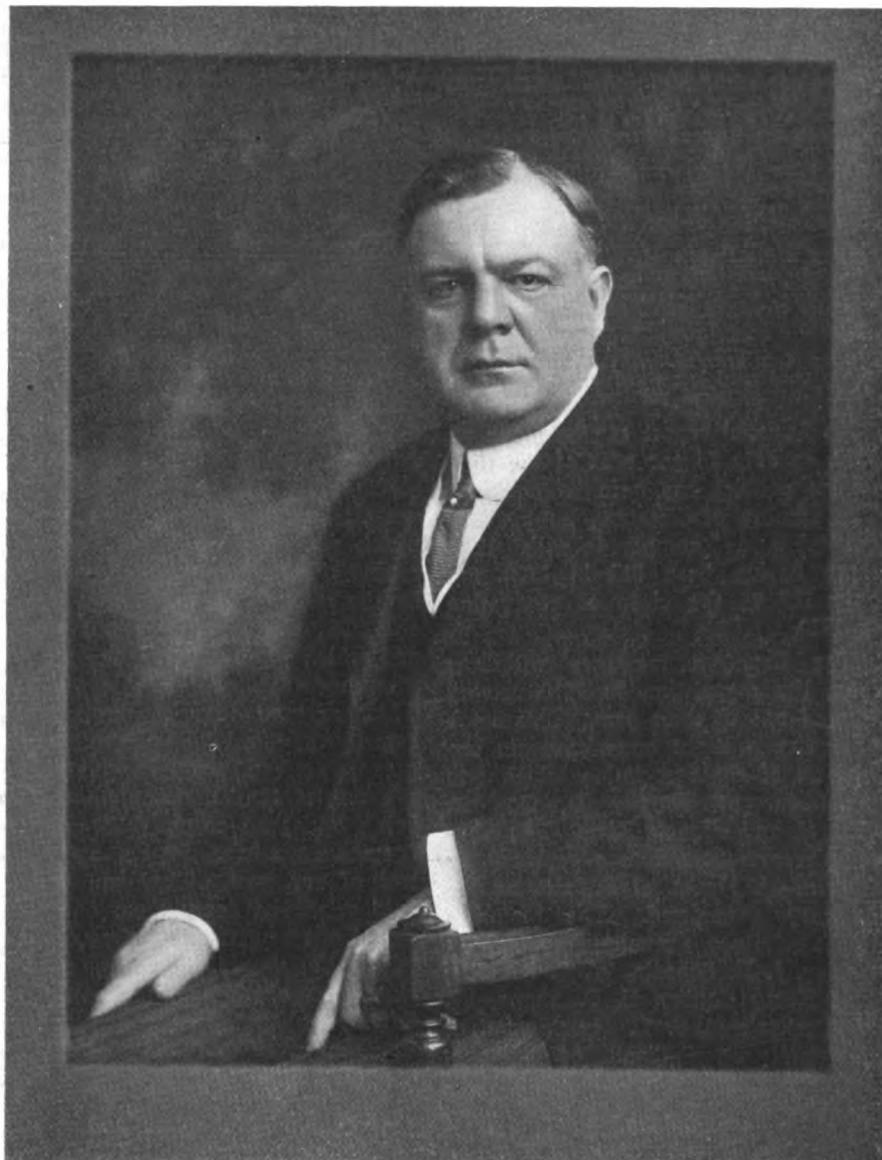
"Of course, gentlemen, you all know that I am very much interested in this insurance movement. When we started out primarily it was not for the purpose of making money; it

was more for the purpose of gathering statistics and finding out why the insurance rate was advancing. The Pittsburg Steamship Co., as you know, carries its own insurance. The insurance in our fleet has averaged

subscriber and each loss more or less discussed.

Face the Issue Resolutely.

"I think we are all of us prone, when our ships get into trouble, to



From his latest portrait.

H. COULBY, PRESIDENT AND GENERAL MANAGER PITTSBURGH STEAMSHIP CO.

about 3½ per cent. In the early part of the period it was higher than that, though during the last two years it has been lower. I attribute that a good deal to the lodging of personal responsibility on the men and that, I believe, is one of the best things that the Great Lakes Protective Association has accomplished. Moreover, if it were practicable, we would get better results, if, instead of having an advisory committee of ten to meet on these losses, we could have an advisory committee made up of every

take it as a personal reflection on the owner and manager and cover up the cause a little bit. An open, free discussion does a good deal of good. While we carry our own insurance we are nevertheless interested in the entire movement because obviously in many accidents more than one ship is involved. The shippers are also jointly interested as the vessel's only source of revenue is freight and if the costs come up it must come out of the freight. Therefore, the more we eliminate expense

the cheaper the freight can be moved. Mr. Ashley has stated that because the Pittsburg Steamship Co. is a compact organization it can do things that would be difficult for scattered organizations to do. I have made it a practice, especially of late, to follow the rule that one side of a story is good until the other has been told, and therefore, before I censure or praise I like to hear the other side of the story. For fear I may be prejudiced I invariably call in some disinterested fellow to size it up. I have not had any hesitancy in very sharply criticizing our own men if we have found any at all and I have encouraged the local inspectors to investigate accidents. In some cases it has resulted in our own men having their licenses suspended. This has happened in cases of grounding where no one's else ship was involved. Of course in a movement of this kind you are not going to accomplish everything in one or two years; but it is a move in the right direction. In 1910 when we get all of our policies I think we shall show better results than were exhibited in 1909, and I think the following year will show better yet. It remains to each individual owner to look after his men. We all make mistakes. The greatest mistake for any man to make is his judgment in sizing up another man. You cannot always tell what a man will do until he has done it. We advance by watching the operation of our ships, in carefully investigating each accident and if we find carelessness or a violation of rules by the observance of which the accident could have been avoided it becomes the duty of each owner to take action.

"Of course there has been a great deal of talk about the rule we laid down of suspension without pay for thirty days when there was proof that the rules had been violated; but its enforcement has produced good results.

Question of Personal Responsibility.

"Since I have had anything to do with a fleet of boats, and that goes back a good many years, we never moved as much freight with as small a measure of accidents as we did during the last year. Our boats went around with their usual dispatch; they were all moved from early spring until late in the fall yet we made the best record we have ever made. Our fellows got onto it that we were watching them and that they would have to explain any accident

and if it was found that there had been any negligence on their part they would be one of the mourners at the funeral.

"It is a question of personal responsibility. There is no other way that I know of to eliminate the large percentage of accidents which are brought about through carelessness. I think if you will go through the record that has been presented here today in the report of the chairman and analyze the causes you will be convinced that something will have to be done.

"I had occasion the other night to make a little talk on the evolution of the lake business, and I took the figures of the old Minnesota boat Manola way back in 1890, at \$200,000, and I find that through that year she made the same number of trips that the Rogers made in 1909, a 600-footer. When I came to analyze the cost of the ship's operation I found that in 1890 on a \$200,000 investment we paid \$4,200 to the underwriters to insure that ship. The Rogers was put in my comparison at just double the cost of the Manola or \$400,000 and the amount of money she turned in to the insurance fund was between \$19,000 and \$20,000. She made the same number of trips up and down the lakes, the record was 26 trips.

The insurance premium had multiplied nearly five times.

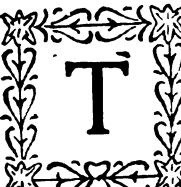
"I do not believe the underwriters made any more money on the amount of property insured in 1909 than they did in 1890. When you stop to consider the tremendous amount of money that has been spent in aids to navigation, it does not seem to me that the natural risk of navigating these lakes has multiplied five times. We have got to look beyond that. From my observation of it I think it has resolved itself down to this: We have not in the past paid enough attention, the trade has been growing fast, we had to promote men fast, and I do not believe the individual manager has gone at it carefully enough and I think also he has been altogether too reluctant to censure his own men when they have made a mistake.

"The object of this Great Lakes Protective Association was primarily to tabulate these statistics, to find where this great amount of damage was done, whether through grounding, collisions, or otherwise. As I say, we ought to pay a little closer attention to the subject, to go after our men, make them parties, make them feel that their continuance in the employ, that their chance for promotion is going to be based not

on good-fellowship, or because they are liked personally, but primarily on their record. When we waken up to that we are going to show even better results, than we did in 1910. We are moving in the right direction. We are going to pay to insure this property just what it costs, and we, and the men under us, make the cost of insurance, the underwriters do not do it.

"Just the minute you reduce the losses so that there is a good return to the underwriters for insuring the properties they will tumble over themselves to get in. I do not care what the underwriters may think of it. They can not build a fence around the insurance business. When we demonstrate that it is a good profitable business all the underwriters, both English and American, will want to get a share, and the closer you will be able to do your business. It is immaterial what the underwriters say about it. We are the fellows who make this rate and just the minute we demonstrate the business can be done for 3 per cent the underwriters will have an awfully hard time to get 5. The question of what he is going to charge us depends not on what he thinks about it, but eventually the owner and the men operating the ship will make the rate on the property."

LAKE CARRIERS' ASSOCIATION

HE Ponchartrain elevators were too much for Rumsey. There was no doubt of that. At the Cadillac he could stand on the marble balustrade, a burly and imposing figure, and threaten the members of the Lake Carriers' Association with bodily injury unless they immediately went to the assembly room. But at the Ponchartrain there is no balustrade; there is no esplanade from which the madding throng may be surveyed and transfixed—nothing at all except the flat corridor, broken by columns, and the three steel elevators. The trouble was with the elevators. When they were on the ground floor the members were scattered and when three or four or a dozen of them were got together the elevators were not there. Then someone would come along and call to somebody else and before the elevators could come down again the members had drifted

away. It isn't usual for anything to stall the tumultuous energy of Rumsey, but the elevators, constantly disappearing, were too much for him.

For nearly a score of years the members of the Lake Carriers' Association have been called together by the stentorian tones of the chief shipping commissioner, but the fact that he could not be seen detracted from the usual picturesque character of the operation this year.

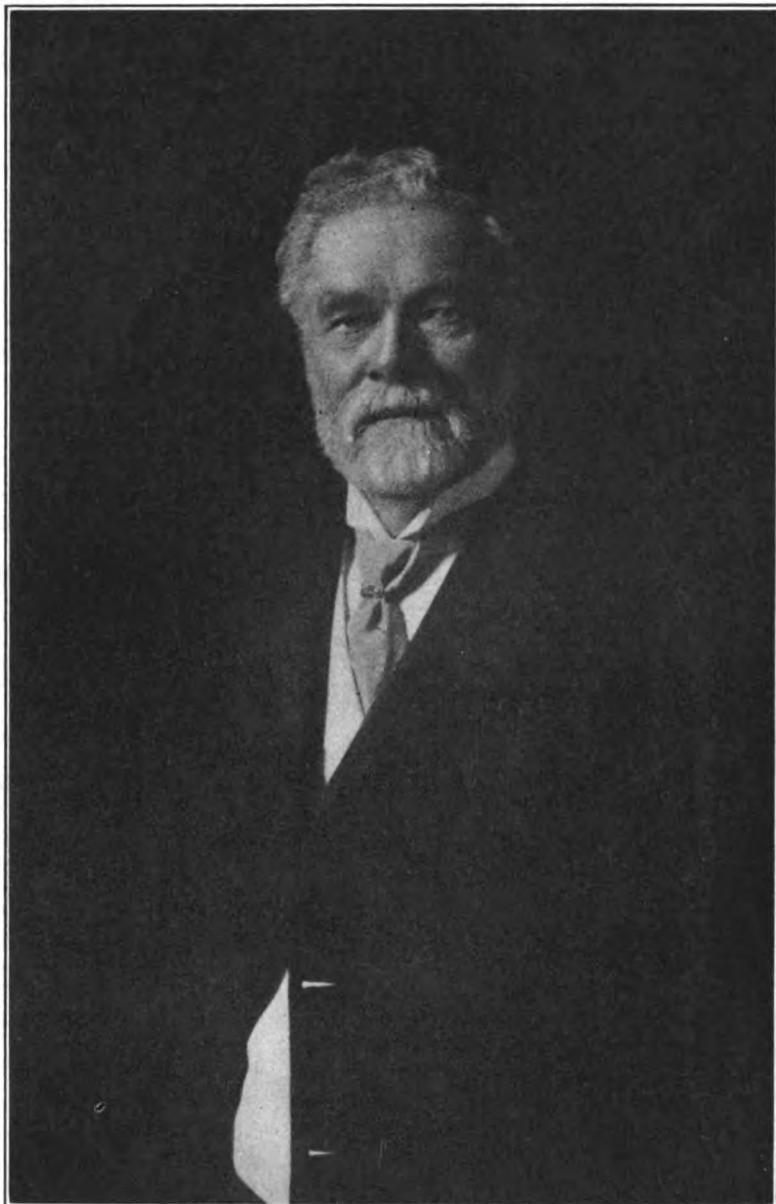
The meeting was well attended and unusually interesting. President William Livingstone, of course, presided. His annual report was the distinguishing feature of the morning session. It makes a considerable volume and is replete with interesting information. In his introduction he says:

Survey of the Year.

"The year has been a singular one throughout and disappointing in the extreme to the independent vessel owner, though the shipping interests owning vessels have probably profited some-

what more than usual owing to the improved dispatch which they enjoyed through the voluntary subtraction of independent tonnage, and the consequently greater proportion of freight which their vessels carried. The year was a practical reversal of conditions obtaining in 1909. It will be recalled that 1909 opened with a certain lassitude of business and a general start was by mutual agreement postponed until the middle of June. As the summer advanced industrial conditions improved and the demand for tonnage thereafter was brisk throughout the year.

"This year navigation opened earlier than usual. The rivers were free from ice during the first week in April. The Mary Boyce passed down through the Straits of Mackinac on April 6 and the Canadian lock was opened for business on April 12. Of course, the general start was not made until April 15, when the insurance policies went into effect, though a few vessels that were operating without insur-



From his latest portrait.

WILLIAM LIVINGSTONE, PRESIDENT LAKE CARRIERS' ASSOCIATION.

ance were already in commission. Shortly after midnight on the morning of April 15, however, a great fleet of vessels left Lake Erie ports carrying coal. It is estimated that over a million tons of coal were afloat waiting for the opening.

"No sooner had this fleet reached the head of the lakes than it became acutely apparent that a surplus of ships existed. So scarce were down cargoes in proportion to tonnage offering that grain on April 20 was taken at the profitless rate of 1 cent. During the last week of April carriers were waiting at both ends of the route, though the actual volume of freight moving was the greatest in the history of the trade, and this in spite of the fact that the whole traffic had to be handled through the

Canadian canal exclusively, with consequent handicap. Vessels were in each other's way at both upper and lower docks. They were under heavy expense and yet idle and it became clear that it were better to lay them up.

Putting Vessels Into Ordinary.

"At a general meeting of independent vessel interests held in Cleveland in June it was concluded to withdraw 20 per cent of the tonnage for thirty days, and during that month about forty vessels went into ordinary. The volume of freight moving, however, was still continuing to break all records. Were it not for this incontrovertible fact some comfort might have been derived from the situation. An enormous volume of freight was

being moved with ease and in spite of all handicaps. One-third of the tonnage was, under instructions issued from the president's office on May 16, loading for the Poe lock, which had an available draught of only 18 ft., meaning, of course, a short cargo. Moreover, the steamer John B. Ketchum had struck Crib No. 4 in the West Neebish Channel on May 22, sinking and blocking the channel for downbound boats until June 3.

"Notwithstanding these obstacles the ore movement in June was not only a record breaker for an early month but for any month in the history of the business, being 7,316,592 tons. After July 1, however, the pace began to slacken. Furnaces grew reluctant to take ore and a kind of creeping paralysis seemed to affect the iron trade. By the middle of July the movement of wild ore was practically cut off and shippers had difficulty in keeping their own vessels busy. The agreement to keep 20 per cent of the independent tonnage in ordinary was extended to continue throughout August, though there was no actual need of such an agreement, as the shippers had no business to offer them.

Slump in the Ore Movement.

"The following figures comparing the ore movements of 1909 and 1910 tell the tale, revealing the enormous impetus given to the trade during the early months of the year and the slump which set in during July and continued with increasing precipitation throughout the fall months. The figures follow:

Month.	1909.	1910.
April	55,794	1,520,305
May	3,253,275	6,081,358
June	5,393,255	7,316,592
July	6,693,025	6,945,289
August	7,193,199	6,964,381
September	7,050,985	6,273,832
October	6,625,801	4,877,441
November	4,899,220	2,641,886
December and to close of season	519,525

"Insurance policies expired on Nov. 30 and no ore was shipped after that date. The Great Lakes Protective Association put itself on record as opposed to any extension of insurance policies under excess insurance. Hull insurance rates were fixed at 6 per cent, being 1 per cent higher than the rates which prevailed in 1909. The underwriters, however, agreed to refund 10 per cent of the earned or net premium to all vessels that operated during the season free from claims. How much this refund may be cannot yet be determined as some of the policies under which the vessels are operating will not expire un-

til after the opening of the season of 1911. It is believed, however, that the number of accidents is much less than usual, especially in the way of bottom damage, showing more careful navigation on the part of the ship. This gratifying condition is to be credited solely to the influence exerted by the Great Lakes Protective Association. Whatever can be done to minimize vessel accidents on the lakes is so much to the pocket of the vessel owner. The insurance companies do not pay vessel damages out of their own pockets. It is the vessel owner who pays for them first of all, for they take the money out of his pocket through the medium of an excess premium. It is expected that the influence exerted by the Great Lakes Protective Association for safe navigation will show concretely in a reduced premium as time goes on.

"There is to be noted, however, additions to the fleet of vessels who operate without insurance or rather carry their own. The fleet controlled by Capt. John Mitchell operated without insurance throughout the year and others that are free from bond issue may do the same.

Advance in Wages.

"The wage scale during 1910 was higher than ever. In order to equalize what was considered to be an inequality in the wage scale of engineers, the wages of engineers of Class B steamers were advanced \$5 a month and second class steamers \$15 a month and on third class steamers \$11 a month. The wages of first assistant engineers were increased from \$10 to \$16 per month, according to class, and a flat rate of \$80 adopted for second engineers. A new rank was also created aboard ship, that of wheelmen-lookouts, they receiving \$5 more per month than the wheelsman who simply stood his trick at the wheel or the watchman who simply watched. These advances worked out horizontally at about 4 per cent or nearly \$5 per day in an advanced season of 240 days. In addition it was agreed to pay the engineers for a season of ten months whether they worked or not. As the average season for ships that operated during the full season was eight and one-half months, this in itself worked out at a considerable bonus. Moreover, fuel was 15 cents a ton higher than 1909, being \$2.60 from the machines and \$2.70 from lighter.

"The one redeeming feature of the trade was the restoration of the ore rate to the basis of 1907, that is to

say, 75 cents from the head of the lakes, 70 cents from Marquette and 60 cents from Escanaba. Carrying charges were not directly restored to this figure but were virtually so in effect, owing to a reduction of 5 cents in the unloading charge. This happy result was largely brought about through the efforts of Harvey D. Goulder, our counsel, and in appreciation of his efforts the independent vessel owners presented him with a loving cup. The carrying charges through the year were 70 cents from the head of the lakes, 65 cents from Marquette and 55 cents from Escanaba, while the unloading charge was reduced from 20 cents to 15 cents.

"It is unfortunate, however, that the ships that operated were unable to take full advantage of the increased earning capacity thus afforded, as stages of water continued very low throughout the entire year and the average cargoes of the largest ships were from 300 to 400 tons less than usual. This accounts for the fact that no cargo records were made during 1910 and why the average of all cargoes shipped is lower than it has been at any time since 1906. Shippers, however, profited in the dispatch which their vessels received, it being common practice for a large freighter to make a round trip in seven days. The shippers also carried a larger proportion of ore than they ever have before.

More Lockage Facilities Needed.

"The commerce of the great lakes has grown altogether too vast to depend upon the present facilities at the Sault. While work upon the third lock, paralleling the Poe lock, is progressing favorably, there should be no cessation of the campaign for a fourth lock. The need of it will be apparent before the third lock is finished. The time is rapidly approaching when every inch of available space to the international line will be needed for locks. It has also been suggested to the Canadian government that additional lockage facilities are needed on that side of the river. The suggestion has been kindly received by the Dominion government though nothing of a definite nature has developed.

"The United Stats canal opened this year on May 5, and closed Dec. 14, a season of 224 days. The Canadian canal opened April 12 and closed Dec. 15, a season of 248 days.

"The delays which have interrupted the progress of work upon the Livingstone channel are of a regrettable character. Every day emphasizes the need of an additional channel at this

point. This fact was pertinently brought home by the sinking of the steamer C. W. Kotcher at the Limekiln Crossing on Nov. 2. She was caught by the wind and cross current and thrown on the west channel bank, blocking navigation completely at night and making the assistance of two tugs necessary for ships to pass her in the daytime. This particular stretch is the most congested bit of waterway in the world, bearing traffic that averages 225 tons for every minute of the twenty-four hours during the whole season of navigation.

"The local inspectors of steam vessels at Buffalo have ruled, and the supervising inspector general has sustained them in the ruling, that licenses as masters to command American vessels cannot be granted to residents of Canada. The case was that of Capt. John I. Fleming, who made application to the American consul at Kingston, Ont., for a renewal of his license. Doubtless all of us approve a decision which reserves the command of the American ship to an American citizen.

Retirement Pay For Life Savers.

"It is gratifying to note that the Senate at the last session of Congress passed a bill providing for retirement pay for life saving crews and others of the field force of the service who become incapacitated for duty. It is earnestly hoped that the bill may pass the House at its present session. No arm of the government service has suffered such neglect as the Life Saving Service, and none is engaged in more hazardous work. The life saver's work is done in times of greatest peril; his active employment is always in the wildest weather. He puts his own life in jeopardy to rescue others. There is no other branch of government work where active service means constant hazard. Common fairness prompts that this service should be better cared for than it has been. It is true that conditions have improved somewhat during the past two years and that it is now possible to persuade competent surfmen to enter the service, but they should also be assured of care when they are no longer able to work. They are just as much entitled to a part pay or a pension as the members of the Revenue Cutter Service or the navy."

After reading the president's report adjournment was taken for luncheon.

Situation at Livingstone Channel.

At the afternoon session Col. C. McD. Townsend, government engineer, upon request of President Liv-

ingstone related the troubles now experienced in the progress of work at the Livingstone channel. Congress provided for widening the channel to double the original width and contracts were so made with the contractors but the channel is not entirely in American waters. One of the problems involved is the building of a dyke entirely on the Canadian side to lessen the flow over the Limekiln crossing and to reduce the cross currents. Some of the citizens of Amherstburg, however, petitioned against it and the matter is apparently held in abeyance by the Canadian government. The mystery about the affair is that the Dominion government does not reply to letters concerning the status of the work. Col. Townsend hoped that the matter would be referred to the International Waterways Commission, which body, he had no doubt, would at once order the resumption of the work.

"If it involves only the dyke," asked Mr. Coulby, "why can't we proceed with the balance of the work?"

"Any question involving the level of the lakes," replied Col. Townsend, "requires the joint consent of both governments."

"The question is then broader than the dyke," said Mr. Coulby.

"Yes, sir."

Col. Townsend stated that the board of engineers had made a preliminary report on the establishment of a fourth lock at the Sault. The report is not yet public property, but it is understood that the board was impressed with the fact that a fourth lock will soon be necessary. Col. Townsend urged that the Poe lock be deepened to 24½ ft. as soon as the third lock is finished. In speaking of the accidents that have occurred at the Sault, he attributed them to the fact that masters are too eager to get through the locks. He thought that accidents were usually caused by a misunderstanding of signals between the pilot house and the engine room and believed that there was room for improvement in this particular.

Mr. Sheadle's Talk on Welfare Work.

A mighty fine talk on welfare work was made by J. H. Sheadle, chairman of the welfare plan.

"Welfare work," said he, "is neither sentimental, fanciful nor ridiculous. In a piece of machinery we try to get efficiency and we accomplish it by either changing parts or adding new devices. Welfare work is simply the application of that principle to human endeavor. The committee appreciates the support it has had from the offi-

cers of the ship. There is always a percentage, of course, disinclined to lend aid. It is a part of the tendency to discredit anything that is new. Welfare work is not the work of the committee. It is your own work. It is that which you yourself contributes that counts. You who put the greatest amount of work into it will get the greatest amount of good out of it. To illustrate, at Conneaut the committee took over some rooms that happened to contain a piano, which the committee purchased. Certainly it would convince anyone of a new element entering into our lake trade to see one of the men playing and the others gathering around and singing. The rooms at Buffalo are delightful. I would urge you to visit the Detroit rooms while you are here. The average attendance at the rooms is 600 and is growing daily and every man coming to these rooms has a respectable boarding place or a home. We have not been giving sufficient attention to personal injury cases. A great many of the personal injury cases come from the workman's own carelessness, but that does not absolve us. We should see what can be done to prevent the man's carelessness. For instance, whenever a man falls through a hatchway it is usually one of the forward or after hatchways. We should make it a point that the covers be put on these hatchways as soon as the dockmen are through. We should also see that the hatch clubs are strong and not likely to break when lifting the covers.

"No one can say that an employe is not a better workman for the independence and self-respect instilled in him by his bank account. Many masters and mates hold during the season considerable money for their men. When the season closes some of these men squander every cent of what they have saved. We had hoped to have a plan worked out whereby the money of the men could be put out to bear interest. If we can devise a way whereby the men can get their savings into a bank and can see the amount recorded to their credit every day in a pass book, they will be prone to avoid extravagance and it would make better men of them."

No Private Light to Maintain.

President Livingstone announced that the association would start the season with no private lights to maintain. The Canadian government has taken over the care of the lightship on Southeast shoal and will care hereafter for all the lights in the lower Detroit river. These lights are in Can-

adian waters, but have hitherto been maintained by the association as private lights.

The following resolution in relation to the work upon the Livingstone channel was adopted:

"Resolved, That we call attention to the great importance of the earliest possible completion of the Livingstone channel and the very great desirability, in point of economy as well as dispatch by doing the work as far as possible in the day, and urge the speedy determination of pending questions producing delay, all a matter of vast importance to the commerce, Canadian and American, and, therefore, be it resolved,

"That, we respectfully urge as a matter of pressing necessity upon the proper officials of both countries, that, by necessary action, they have the work resumed as soon as possible."

Retirement pay was also urged for life-savers, and a resolution was offered by Capt. D. Sullivan, of Chicago, asking congress to increase the pay of the members of the steamboat inspection service, as follows:

Steamboat Inspection Service.

"Resolved, That the association favors and urges consideration by the government of salaries in the steamboat inspection service in view of the services required and rendered.

"We believe that the salary of the supervising inspector general and salaries of the supervising and local inspectors are inadequate to the character, extent and results of the work and the required caliber and responsibilities of these officials. The salaries have not increased with the growth of the work or in keeping with what has obtained in lines of similar work, and we do not hesitate to say are decidedly below the plans of compensation for required ability and service in general lines, and must become unattractive to men of necessary ability, and

"Resolved, that the president and counsel are authorized to ask members of congress to introduce the necessary bill for the increase of these salaries and that the president, whenever he may deem it expedient, appoint a committee to represent at Washington the conviction and suggestion of members of the association, as outlined in these resolutions; and it is further suggested that we, as individuals, call this subject to the attention of congress from our respective districts."

After the election of the board of directors, the unusual honor was paid William Livingstone of re-electing him

president by unanimous vote without waiting for the board to meet, and the fashion having been established, the same courtesy was paid to Mr. Sheadle, vice president, and Mr. Goulder, counsel.

President Livingstone Re-elected Unanimously.

The directors are: J. H. Sheadle, Harry Coulby, Capt. John Mitchell, Harvey D. Goulder, W. C. Richardson, J. S. Ashley, S. P. Shane, Capt. Edward Morton, W. H. Becker, W. A. Hawgood, Walter H. McGean and A. F. Harvey, of Cleveland; William Livingstone, Detroit; F. W. Gilchrist, Alpena; Capt. D. Sullivan and C. W. Elphicke, of Chicago; J. J. H. Brown, T. T. Morford, Charles M. Heald and W. E. Lloyd, of Buffalo; A. B. Wolvin and G. A. Tomlinson, of Duluth; Howard L. Shaw and S. P. Cranage, of Bay City; F. W. Smith, of Milwaukee; John Craig, of Toledo; H. S. Wilkinson, Syracuse; W. M. Mills, of Tonawanda, and C. D. Dyer, of Pittsburgh.

The executive committee consists of William Livingstone, J. H. Sheadle, S. P. Shane, Capt. John Mitchell, J. J. H. Brown, Charles M. Heald and D. Sullivan. The alternates are J. S. Ashley, A. F. Harvey, W. C. Richardson, W. A. Hawgood, G. A. Tomlinson and W. E. Lloyd.

George A. Marr was re-elected secretary and Capt. George P. McKay treasurer.

Mr. Humphrey's Stirring Address.

The annual dinner of the Lake Carriers was held at the Hotel Ponchartrain, on Thursday evening. Representative William E. Humphrey, of Washington, was the principal speaker. He made a stirring address upon the subject of the American merchant marine.

"Japan could seize Seattle, Tacoma, Portland, the Bremerton government navy yard, five great transcontinental railways, fortify mountain passes, and have an empire upon which to live, before the United States could get 75,000 troops to the Pacific ocean," he declared.

"The nations of the earth know our condition and they know that we are utterly unprepared for war. They know that our army is too small, that our navy is practically helpless because we have no merchant vessels as an auxiliary. They know that we have no transports for the one and no auxiliaries for the other."

"The war department will tell you that in case of a contest we would need for transports 250 vessels. We have not on both oceans combined

20 vessels fit for this purpose. The department will tell you that we would need 40 vessels in 15 days after hostilities were declared. We could not have 40 vessels in 40 weeks."

"Russia and the United States are the only nations of the earth that have committed the criminal folly of building a great navy without at the same time building a great merchant marine as an auxiliary, to furnish trained seamen for the vessels of war. Russia has learned her lesson. All indications point to the fact that if war comes again it will come upon the Pacific. If it does, and we remain in our present condition, the fate of Russia will be our fate."

"I do not prophesy war with Japan. I see no reason for war with that country. But it is not given to any man to look into the seeds of time. The only guarantee of peace upon the Pacific is to be prepared for war."

"Those who talk so confidently that Japan would not declare war against this country if she considered that she had sufficient cause have studied the history of that wonderful and patriotic little nation to small purpose. Few know how near we were to war over the San Francisco incident. It was only averted by conceding to Japan her demands. An American citizen could not attend Japan's schools, but Japan demanded that Japanese be permitted to attend our schools and this demand was granted. Why? Because we were then, as now, utterly helpless. So we humbled our pride and endured our humiliation."

Japan's Preparedness For War.

"Japan has 600 merchant vessels on the Pacific fit for transports. The United States has six. Japan can transport 250,000 troops at one time. The United States not more than 10,000. Japan has 500,000 trained seamen for crews for her vessels of war. On the Pacific there are not 1,000 sailors. Japan could place 200,000 men in the Philippines, and 100,000 in Hawaii before we could get 10,000 troops ready to embark from any port upon the Pacific. The United States could not get 50,000 troops in the Philippines in a year."

"In case of war Japan could come down the coast of Alaska to within 48 hours of Seattle and all along the Alaskan coast she would find splendid harbors where she could coal her fleet. Each of these Alaskan harbors, totally unprotected, would answer the purpose of a naval base. She could then seize Seattle, Tacoma, Portland, the government navy yard at Bremerton and

five great transcontinental railways, fortify the mountain passes and have an empire upon which to live, one of the most productive regions upon the globe. She could do all this before we could get 75,000 troops to the Pacific ocean. In such a contest we would not dare attempt to send troops to either Hawaii or the Philippines. If we had the troops and the ships, and we have neither, we would not dare to send them, for we have no battleship fleet to meet the battleship fleet of Japan. In case of a contest with Japan all military authorities agree that we could do nothing with the army, we would have to depend entirely upon our navy, on the unavailable battleship fleet now on the Atlantic. So I ask you tonight, as patriotic American citizens, if it is not criminal folly to expend \$130,000,000 a year to maintain a navy in time of peace that is worthless in time of war."

The Monopoly of the Sea.

Mr. Humphrey then turned his attention to the steamship trust, making sensational charges.

"The government a few days ago commenced suit against the foreign steamship trust because of its action in reference to the carrying of steerage passengers," he said. "This trust has fixed the passenger rate, divided the business and pooled the profits."

"This monopoly of the sea that is preying upon our commerce includes practically every foreign vessel on the ocean, both sail and steam. This combine of foreign ships is the most gigantic trust the world has ever known. The commerce of this country is absolutely at its mercy. The head of this greatest of monopolies is the Hamburg-American Co. This company admitted a dividend of 10 per cent annually upon a capital of \$96,000,000, but, according to its own statements, a profit of more than 25 per cent annually is shown."

"All these lines give special rates to the giant corporations of this country, especially the Standard Oil, the steel trust and the harvester combine. These discriminations are such that they effectually prevent any competitor in this country of any of these corporations I have named from competing with them in foreign fields."

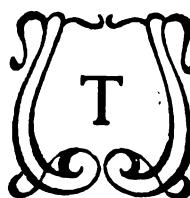
"The head and front of this gigantic combine that dictates the rates that every American must pay on every pound of freight carried upon the ocean; that dictates even to our government the rate that it must pay to send our mails across the sea, is

Herr Ballin, president of the Hamburg-American Co., the most powerful private citizen in all Europe, whose influence in the German empire is exceeded only by that of the emperor. It might be well for the American people to remember that

this is the same Herr Ballin and the same company that in answer to the suits filed against them have replied in effect—we defy your law and ask you what you are going to do about it; the same Herr Ballin who has advised the American people that they

should be against all subsidy legislation; the same Herr Ballin whose company at the beginning of our last war withdrew some of its fastest and its best vessels and sold them to Spain to 'sink, burn and destroy American commerce.'

PITTSBURGH STEAMSHIP COMPANY'S ANNUAL MEETING



HE annual meetings of the Pittsburgh Steamship Co.'s officials and masters and engineers have annually grown in interest, that is to say, some new feature develops each year in the process of cementing and bring closer together the management and the men. This year it is the unfolding of a retirement plan and the extension of the United States Steel Corporation and Carnegie pension funds to include the Pittsburgh Steamship Co., providing that each employe who has been in the service for twenty years shall be pensioned upon reaching the age of seventy years. It is also the intention to ease the burden upon masters and chief engineers after they have reached the age of sixty-five years, as outlined in the following announcement by Mr. Coulby:

That no captain or chief engineer would be given a permanent assignment on vessels after he had reached the age of sixty-five years, but that upon reaching such age, captains and chief engineers who have previously been employed by the company in such capacities respectively for at least five years immediately preceding, shall be retained in the service for the performance of such shore duty as may be assigned to them, or for temporary assignment on ships during the season of navigation at the regular wages during the time thus assigned which may be paid for the positions to which assignments are thus made; provided, however, that an annual minimum pay for services shall be made to captains and chief engineers retained in the service under above conditions as follows:

Captains of steamers.....	\$750
Captains of barges.....	250
Chief engineers.....	600

And, further, that no captain or chief engineer shall be retained in the service under aforesaid conditions after he reaches the age of seventy years, at which age he will be permanently retired under the provisions of the United States Steel and Carnegie pension fund.

Compulsory Retiring Age.

Nearly all of the trans-Atlantic lines have a compulsory retiring age at sixty-two years but as there is no winter navigation on the lakes he thought that the period might safely be extended to sixty-five years. The purpose is simply to safeguard the efficiency of the line staff. Five captains were retired under the plan and five mates accordingly promoted. In fact since Mr. Coulby has been the head of the company forty mates have been promoted to command of steamers.

In line with this policy of filling vacancies by promotion Mr. Coulby has designated twelve captains of Class A steamers to serve as a committee on mates. Written reports will be made monthly upon the qualifications of the mates and each member of the committee will be expected to acquaint himself with the merits of mates in general as they happen to meet the various masters in the course of the season. At the end of the season all the information will be tabulated and recommendations made accordingly. The committee has adopted the following rules for their guidance which have been approved by the officials:

Rules of Committee on Mates.

1—That no man shall be promoted from wheelsman to second mate in this line who is over thirty years of age.

2—A second mate shall serve not less than one year as second mate of a second or third-class boat, and two years second mate of a first-class boat before he is eligible for promotion to first mate.

3—A man shall have served four years as first mate of a first-class boat before he is eligible for a master's berth, two years of this time being in Class A boats.

4—A man shall have the following qualifications before he is recommended to Class A captains: He must understand that the use of liquor is strictly prohibited. He must be of sufficient intelligence to be able to

discuss the workings of the ship. He must exhibit tact in the handling of the crew. He must have, under your guidance, taken the boat light and loaded up and down the rivers day and night, and should to your personal knowledge be able to take the boat from one end of the route to the other. He should be able to make all courses and should have done so for you. He should be able to take four-point bearings, understand the use of the pelorus and should have demonstrated to you that he is able to take soundings with the hand-lead and the sounding machine. He should be able to load the boat and get along with the dock people. He should be able to do all clerical work done on shipboard. In short, no man should be recommended who is not, in your opinion, competent to make a future master for us and of the type you would be glad to see made one.

5—While permission is given masters of first-class boats, in case they lose their second mate during the season of navigation, to promote any man on the boat who has papers, it is understood that such man on the opening of the next season will be compelled to go at least one year second mate of a second or third-class boat before going into a first-class boat again as second mate.

6—Any master of a second or third-class boat who has a man with papers is entitled to the same privilege under the same circumstances.

7—Before a second mate is recommended for promotion to first mate of one of the small boats he should be in all ways thoroughly competent to assume the duties of a first mate.

8—All first mates of first-class steamers will be required to hold masters' licenses unlimited.

Captains on Retired List.

The captains of steamers that were placed on the retired list are: A. C. Chapman, C. H. Cummings, E. M. Fish, W. B. MacGregor and A. G. McLeod. Barge captains placed on the retired list are F. H. Rae and John H. Dissette. The mates advanced to masters' berths are: Neil Rolpson, William Milliken, Thomas Naden, H. W. McEwen and C. M. Conkey. Capt. C. Gugenheimer, W.

H. Moody and R. F. Humble were given 600-ft. steamers.

F. B. Smith, fleet engineer of the company, who has been appointed a member of the United States Steel Corporation's committee on safety appliances, spoke at length on this subject. He said that the Steel Corporation is very much in earnest on the subject of safeguarding life and limb and that Mr. Coulby had hammered away at him to keep the subject of safety appliances well in mind when inspecting the ships. The result is that personal injury cases on the vessels of the Pittsburgh Steamship Co. are very few.

H. A. Kelley, general counsel for the Pittsburgh Steamship Co., gave an informal talk on accidents. He also interpreted the pilot rules from the legal standpoint.

George A. Marr, secretary of the Lake Carriers' Association, explained the workings of the welfare plan.

Meeting With Dock Superintendents.

Dock superintendents at both upper and lower lake ports attended the meeting and discussed the handling of vessels at the docks. E. C. Collins, traffic manager of the Pittsburgh Steamship Co., gave an interesting talk on dispatch. The new dock at Ashtabula made a splendid record, the average detention being 1 hour 5 minutes per 1,000 tons. It was the general opinion that the docks are safer than ever and that the relationship between dock and vessel is most harmonious.

The meeting of captains ended with a dinner at the Hollenden, W. B. Dickson, first vice president of the United States Steel Corporation, being the principal speaker.

A brief meeting of the chief engineers of the Pittsburgh Steamship Co. and Pickands, Mather & Co.'s fleets followed. Regarding the plan that the Lake Carriers' Association are evolving through the welfare committee to enable the men to save their money, Mr. Coulby said:

"I believe when you encourage your men, and particularly the young men coming along, to start a bank account and save their money you will be making better men out of them. Like all new things the men may not pay a great deal of attention to it at the start, so when the plan is launched by the Lake Carriers, let us put our shoulder to the wheel and push it along. There may be some things about the plan which experience will demonstrate should be changed. After a new engine has been started it

generally needs a little adjusting. When your men come to you and ask you to hold part of their money explain to them how they can put it in as good a bank as can be selected, and that it will be drawing interest for them."

The appointments of masters and engineers, subject to change, follow:

Steamer.	Captain.
Baker.....	George Bell
Buffington.....	R. Jollie
Cole.....	J. W. Morgan
Dickson.....	W. H. Moody
Dinkey.....	W. H. Hunt
Lynch.....	C. G. Grant
Morgan.....	F. J. Crowley
Morgan, Jr.	Neil Campbell
Olcott.....	A. R. Robinson
Palmer.....	A. P. Chambers
Phipps.....	R. F. Humble
Ream.....	C. Gegenheimer
Rogers.....	S. C. Allen
Schiller.....	J. La Framboise
Widener.....	M. K. Chamberlain
Corey.....	F. A. Bailey
Frick.....	W. H. Kilby
Gary.....	John Burns
Perkins.....	W. S. Hoag
Edenborn.....	H. Harbottle
Ellwood.....	Fred Hofftote
Gates.....	J. A. Walsh
Hill.....	A. J. Talbot
Poe.....	W. C. Iler
Morse.....	John Nahrstedt
Houghton.....	J. F. Parke
Cornell.....	J. R. Noble
Harvard.....	James Burr
Princeton.....	George H. Bunker
Rensselaer.....	C. D. Secord
Malietoa.....	Frank Rice
Bunsen.....	J. T. Gemmell
Van Hise.....	T. J. Cullen
Murphy.....	George Bowen
Shaw.....	George Randolph
Mataafa.....	H. J. Regan
Maunaloa.....	A. C. Smith
Superior City.....	C. A. Weitzman
Black.....	A. Hansen
McDougall.....	George Holdridge
Fairbairn.....	George McCallum
Fulton.....	C. G. Ennis
Bessemer.....	C. S. Boyce
Siemens.....	W. P. McElroy
Coralia.....	W. H. Campau
Stephenson.....	George Stover
Watt.....	A. Montague
Crescent City.....	H. Culp
Empire City.....	Thomas Wilson
Maricopa.....	S. E. Meeker
Ericsson.....	George Burt
Linn.....	A. W. Burrows
Queen City.....	E. L. Sawyer
Zenith City.....	A. R. Thompson
Eads.....	J. C. Bell
Rockefeller.....	D. McGilvray
Cort.....	J. A. Ferguson
Neilson.....	W. J. Story
Maritana.....	F. D. Selee
Mariposa.....	H. A. Kelley
Gilbert.....	W. E. Warner
Briton.....	F. W. Light
German.....	A. C. Moser
Roman.....	D. Murphy
Saxon.....	Allen Collins
Corona.....	D. Bouille
Corsica.....	Charles Thrasher
Manola.....	W. J. Ames
Mariska.....	George Ackley
Maruba.....	George Reece
Maatoa.....	H. Walper
Marina.....	K. McRae
Masaba.....	T. F. Zealand
Colgate.....	P. H. Dunn
Mather.....	Neil Rolpson
Griffin.....	William Milliken
Joliet.....	Thomas Naden
LaSalle.....	H. W. McEwen
Watatam.....	C. M. Conkey

The appointments of the chief engineers for the steamers of the company follow:

Steamer.	Chief Engineer.
Baker.....	E. S. Stoddard
Bessemer.....	H. Edmonson
Black.....	H. W. Endelman
Briton.....	J. D. Falker
Buffington.....	John Dupont
Bunsen.....	J. F. Walsh
Cole.....	H. T. McLeod
Colgate.....	William E. Lloyd

Coralia	W. P. Diamond
Corey	M. Toner
Cornell	E. E. Buddemeyer
Corsica	W. Rice
Corona	R. H. Flood
Cort	R. H. Richmond
Crescent	James McKibbin
Dickson	John Skelly
Dinkey	A. J. Arsmo
Eads	William Dornbrook
Edenborn	George Barth
Ellwood	Floyd Lyons
Empire	Leland Haggan
Ericsson	John Marz
Fairbairn	Thomas Treleaven
Frick	S. W. Armstrong
Fulton	William Densmore
Gary	H. Dupont
Gates	H. F. Schroeder
German	James Goulding
Gilbert	G. W. Andrew
Griffith	John Miller
Harvard	Fred Warning
Hill	L. L. Hineline
Houghton	William Bourlier
Joliet	G. C. Deaska
LaSalle	F. J. Yelp
Linn	Gus Johnson
Lynch	A. L. Eggert
McDougall	Frank Limpert
Maleatoa	C. E. Lawrence
Manola	J. E. Ducharme
Maricopa	J. H. McGlenn
Marina	S. D. Birdsall
Mariposa	H. M. Lubahn
Mariska	A. W. Smith
Maritana	W. C. McDougall
Maruba	John Skeldon
Masaba	J. H. Riggan
Mataafa	George R. Emrey
Mather	James Brand
Matoa	U. Shoemaker
Maunaloa	J. W. McEachren
Morgan, Jr.	A. Jackson
Morse	W. A. Marshall
Murphy	George Arnold
Neilson	T. C. McAree
Olcott	C. Fletcher
Palmer	H. E. McIntosh
Perkins	E. W. Fox
Phipps	E. H. Learned
Poe	Joseph Hasler
Princeton	C. L. Birstrand
Queen	R. W. Townsend
Ream	F. J. Spencer
Rensselaer	Frank Schwartz
Rockefeller	George Schroder
Rogers	S. D. Graham
Roman	W. D. Killett
Saxon	E. J. Rae
Schiller	Alex McKenzie
Shaw	M. B. Sturtevant
Siemens	L. O. Willix
Stephenson	L. H. Smith
Superior City	H. B. Moore
Van Hise	M. F. Sweeney
Watt	J. M. Connory
Watatam	C. M. Mills
Widener	A. W. Arsmo
Zenith	H. N. Armstrong
Reed	Neil Patterson
Hoyt	G. L. Barnhart
Kerr	K. MacGregor

The appointments of masters of the barges and mates of the steamers follow:

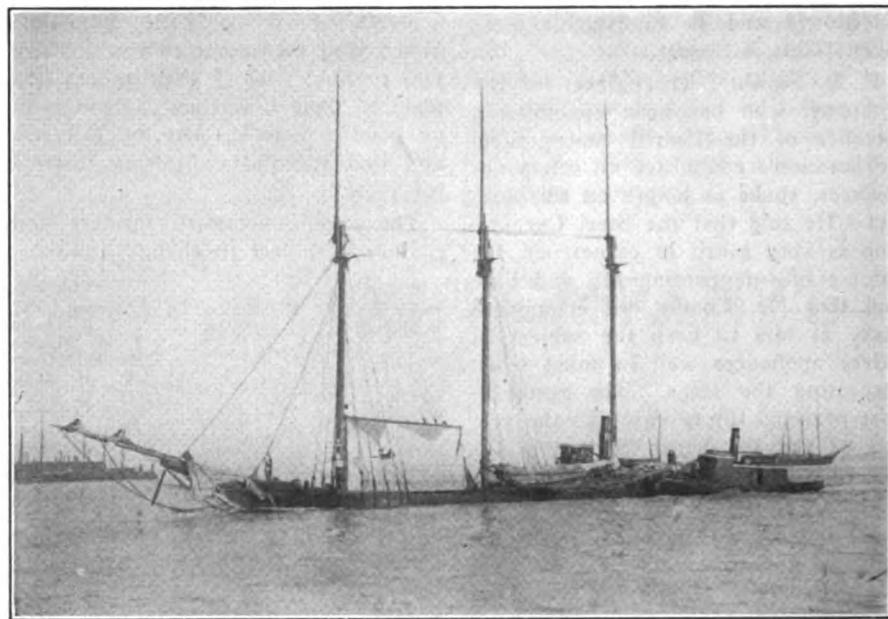
Barge.	Captain.
Pryn Mawr.....	George Campbell
Bell	J. H. Denner
Carrington	H. M. Saveland
Corliss	H. M. White
Fritz	J. V. Snorell
Holley	Donald Graham
Jenney	Robert Thompson
Krupp	P. Gustavson
Maia	A. Nordahl
Maida	William McDonald
Manda	A. S. Hand
Manila	Charles Gordon
Malta	J. R. Parker
Maria	H. A. Kirby
Marsala	C. H. Wilson
Martha	J. N. Ames
Nasmvlk	George Young
Roebling	W. H. Dick
Smeaton	A. Beaupre
Thomas	George Maloney
137	O. W. Holdridge
Steamer.	First Mate.
Paker	J. Smith
Bulington	Hughes
Cole	McLeod
Dickson	George Huntington
Dinkey	Jack
Lynch	Bernard

Morgan	Shay
Morgan, Jr.	Peters
Olcott	Brown
Palmer	George Huckle
Phipps	Birmingham
Ream	Saunders
Rogers	C. Benson
Schiller	Klegg
Widener	Murray
Corey	Durkee
Frick	Grant
Gary	F. Gould
Perkins	Glenn
Edenborn	Tom LeRoy
Ellwood	Reynolds
Gates	Munson
Hill	Small
Poe	Mallory
Morse	W. Brown
Houghton	Fairbanks
Cornell	A. J. McLeod
Harvard	Stover
Princeton	Ratchet
Renssaeler	Campbell
Malietoa	Sturridge
Bunsen	Finnigan
Van Hise	Parsons
Murphy	Conlin
Shaw	Kerns
Mataafa	Allair
Maunaloa	Sharow
Superior City	Patterson
Black	Davis
McDougall	Forbes
Fairbairn	Ferguson
Fulton	Edward Zeim
Pessemer	Roach
Siemens	Wade
Coralia	Ballhouse
Stephenson	Tyler
Watt	Axford
Crescent City	Bowerman
Empire City	E. W. McLeod
Maricopa	J. J. McDonald
Ericsson	Coffey
Linn	Hunt
Queen City	Male
Zenith City	Dodge
Eads	Ashby
Rockefeller	Endleman
Cort	Escott
Neilson	Grondy
Maritana	Slater
Mariposa	Dougherty
Gilbert	McLaughlin
Briton	Kane
German	Krohn
Roman	Joiner
Saxon	B. Smith
Corona	C. H. Christensen
Manola	L. B. Conlin
Corsica	Culp
Mariska	Deveney
Maruba	Duff
Marina	Boomer
Matoa	Miller
Masaba	Rourke
Colgate	Dupee
Mather	J. McDonald
Griffin	Sullivan
Joliet	Cullon
La Salle	Con Christianson
Wawatam	Lourie

M. A. Hanna & Co.'s Fleet

The meeting of the officials and masters of the fleet operated by M. A. Hanna & Co. was held at the Hollenden, Jan. 26 and was presided over by J. S. Ashley. Frank Henrich, compass adjuster, gave a talk on the workings of the compass and H. A. Kelley explained the rules of the road. At the dinner in the evening Harvey D. Goulder was the principal speaker. Mr. Ashley announced the following appointments:

Vessel.	Captain.
E. Y. Townsend	Edward Sullivan
D. J. Morrell	P. L. Millen
L. C. Hanna	M. Anderson
P. Stackhouse	William McGarvey
La Belle	B. W. Landfair
I. M. Scott	A. McArthur
Joseph Wood	V. L. Hosner
Charles S. Price	George B. Brock
Quincy M. Shaw	William Langell
William F. Fitch	W. A. Black
G. A. Flagg	J. Autterson



TOWING THE SCHOONER ABBIE G. COLE INTO BOSTON HARBOR.

R. S. Warner	Jesse Brines
Republic	A. J. Green
S. D. Warriner	George Levis
A. W. Thompson	F. C. Hart
Alex. Maitland	Robert Peltier
	First Mate.
E. Y. Townsend	Gus Hartman
S. J. Morrell	R. Campbell
L. C. Hanna	H. Wendorf
P. Stackhouse	I. Karsch
La Belle	William Fross
I. M. Scott	Fred J. Sell
James Wood	John Ward
C. S. Price	Willis Jerome
Quincy M. Shaw	Philip Lennon
W. F. Fitch	William Witte
G. A. Flagg	Samuel Brines
R. S. Warner	F. Sturtevant
Republic	Edward Vessey

Pickands, Mather & Co.'s Fleet

Capt. Daniel H. Mallory, the oldest master in the service of Pickands, Mather & Co., has been retired on pension, making a shift in the line-up for 1911 which is as follows:

Vessels.	Captains.
J. C. Morse	A. H. Reed
Amasa Stone	W. A. Reed
Samuel Mather	L. W. Stone
D. O. Mills	James Jackson
Adriatic	C. C. Stewart
Crete	W. A. Williams
Elba	C. H. Woodford
Verona	J. S. Nea
Calumet	Elmer Trimm
Hemlock	Peter Cartwright
Odanah	Ralph Nutting
Normania	Oscar Olsen
Victory	J. H. Lowes
Pathfinder	A. M. Jenkins
Constitution	P. A. Peters
Sagamore	A. E. Mallett
Santiago	George Shaw
	Chief Engineer.
Samuel Mather	Edgar Arnold
Amasa Stone	C. A. Heisner
J. C. Morse	A. A. Manion
D. O. Mills	H. A. Woods
Crete	F. A. Steadley
Verona	G. A. Butler
Adriatic	H. H. Kessel
Odanah	J. A. Southgate
Calumet	G. A. Brown
Hemlock	P. F. Caniff
Elba	Aubrey Rivard
Victory	Ray Arnold
Pathfinder	Leo Arnold
Normania	Herman Folkerts

Gresham's Busy Day

The revenue cutter Gresham, Capt. Preston H. Uberroth, commanding, put in a very busy day on Dec. 17. She rescued the crew of a schooner in great distress and almost immediately thereafter took the crew off the dismasted schooner S. A. Fownes. Three hours later the Gresham took in tow the schooner N. E. Ayer, towing her to Provincetown, and then, in response to wireless messages, went to the relief of the schooner Abbie G. Cole, stranded on Stone Horse shoal and facing a 60-mile gale. The work of taking off the crew was most hazardous, and was safely accomplished and the schooner towed into Boston harbor.

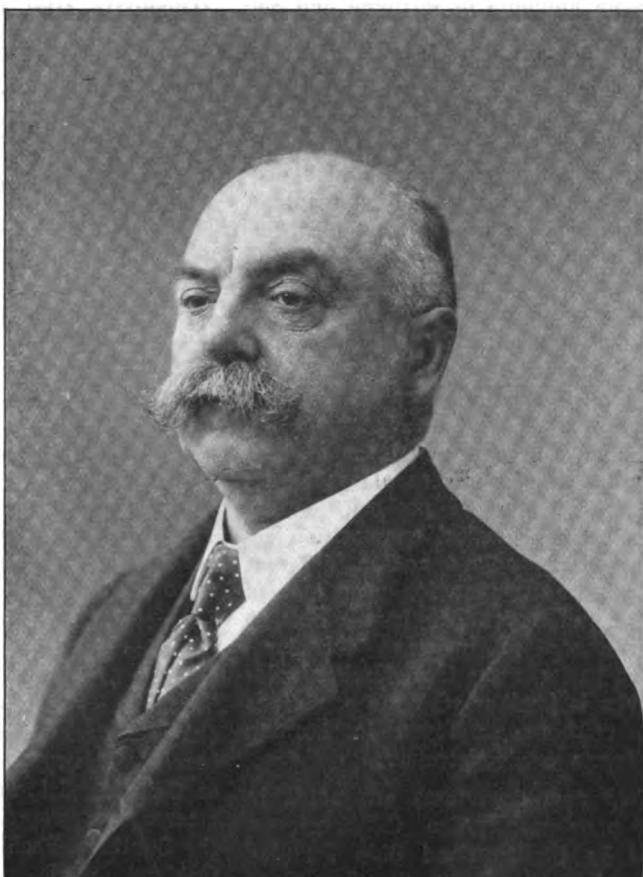
A dispatch from Los Angeles states that the citrus growers and packers of that section are planning to start shipping their products to the Atlantic coast by water. A special rate of 50 cents per hundred has been secured and the first shipment left San Pedro on Dec. 13. If the trial shipment is a success it will mean a great revolution in the shipment of citrus fruits to the East and will eliminate the bitter controversies which have been heretofore waged between the shippers and the railroads. The large acreages of San Bernardino, Riverside, Redlands and in fact the entire Southern country will furnish much of this variety of freight for vessels engaged in the Atlantic and Pacific trade.

Death of Calvin B. Orcutt

The sudden death of Calvin B. Orcutt, president of the Newport News Ship Building & Dry Dock Co., at the Johns Hopkins hospital, Baltimore, on Jan 30, where he had gone for an operation, was a great shock to shipping circles, as he had been reported doing well earlier in the day. No man in the ship building and marine world will be more missed than Mr. Orcutt, who had been an active force in this field for over a quarter of a century. Mr. Orcutt has been accustomed to deal with large affairs since his young manhood, and when the late Collis P. Huntington conceived the idea of establishing a great ship yard at Newport News he selected Mr. Orcutt to manage it. From the day of its inception the Newport News yard has taken a leading part in the industry in the United States. It has been continuously busy and has turned out an imposing fleet of battleships and merchant vessels. The yard became an enormous consumer of the products of the steel mills and Mr. Orcutt's connection with the leading steel interests was particularly close and intimate. With two or three exceptions the Southern Pacific Co.'s entire fleet of fine steamships are the creation of this yard. It also built some of the magnificent Orient liners for the Pacific Mail Steamship Co., as well as numerous vessels for the coastwise service, and it has rarely been without an order from the navy department.

Mr. Orcutt felt deeply upon the subject of the American merchant marine and one of the most earnest pleas made before the Merchant Marine Commission in behalf of our oversea shipping was made by him. Mr. Orcutt was born in Wyoming, N. Y., Sept. 5, 1847, and began his

business career in a banking house, remaining there 14 years. In 1878 he associated himself with the Chesapeake & Ohio railway, which was at that time seeking an outlet to tide-water. When this railway became a



MR. CALVIN B. ORCUTT

coal carrier Mr. Orcutt organized the Chesapeake & Ohio Coal Agency, and continued thereafter to be a prominent figure in eastern coal circles.

Mr. Orcutt was a resident of Elizabeth, N. J., in the affairs of which he took an active personal interest. He was president of the Elizabeth Young Men's Christian Association and served as superintendent of the Second Presbyterian Sunday school for nearly 35 years. He was a member of the board of directors of the Elizabeth general hospital and annually donated a gold medal to the nurse making the best record. He touched the life of his times at so many points that his untimely taking off is a calamity.

Commerce of Duluth-Superior Harbor

The commerce of Lake Superior has in recent years developed to enormous proportions. More than one-half of it is credited to Duluth-Superior harbor. The capacity of this harbor is

very large, due to the wide area of naturally protected water at Minnesota Point, and to the liberality of congress in deepening the interior basins and channels. There are forty-nine miles of established harbor lines and within these harbor lines there is an area of eleven square miles. Of this area there is about eight and one-half miles of wharfage space, besides room for the necessary slips. The present area of wharves in operation or under construction is about one square mile, leaving seven and one-half square miles of unoccupied space available for additional wharves. There is therefore abundant space for a notable increase in commerce. It is believed that the tonnage of Duluth-Superior harbor is only exceeded by that of two ports in the United States—New York and Philadelphia.

From the time the development of this harbor began in 1867 up to June 30, 1910, the government had expended the sum of \$6,253,172.88 in improving it. The vessel freight received and shipped at that port during the same period was 298,508,435 short tons and its market value was \$3,365,288,779. The cost, therefore, of the government improvements has been less than one-fifth of 1 per cent of the value of the freight transported. The annual expenses of government operations in this harbor are approximately \$298,858, which when compared with the commerce of 1909 works out at about 1 cent for each ton of freight carried. Compared with the value of the commerce carried it works out at about one-ninth of 1 per cent. For a further comparison, it appears that the annual expense is only about one-half of 1 per cent of the saving in cost of transportation by water as compared with rail rates. In fact, the ton-mile cost multiplied by the average haul shows a saving of \$1.78 per ton as compared with the rail rates. This shows a saving of \$57,902,156 on the commerce of Duluth-Superior harbor during 1909, and of \$95,225,889 on the total commerce of Lake Superior for that year. The annual saving, therefore, on this lake alone is almost twice the sum that the government has expended on all improvements from the foot of Lake Erie to the head of Lake Superior since the lakes have been commercially navigated. No private enterprise has ever won such rewards or could possibly hope to. The chief satisfaction lies in the fact that the enormous dividends thus declared go to the whole people.

Ship Building on the Pacific Coast in 1910

PERHAPS the best way to point out what has been done on the Pacific coast during the past year is to make specific note of a number of the best products of the coast yards. This will give a clearer view of what has and is being done, inasmuch as the total built is comparatively small. The entire coast and particularly the builders in and near San Francisco, are feeling the effects of the eight-hour day most severely and have for the most part, been unable to compete successfully for contracts let by the government.

With a labor charge 35 per cent higher than that of eastern yards, and all the steel and iron material used in the construction of ships, brought from eastern or foreign markets, the coast yards are confining themselves to ships of relatively small size that cannot well be taken around the Horn. On the other hand, local transportation companies are showing an exceedingly broad-minded viewpoint by awarding contracts to local coast yards for new tonnage at a price in excess of eastern prices.

A feature of the ship building on the Pacific coast for the past year is the extensive use of steel for building. One firm which was formerly a large builder of wooden ships, has for the past two years done no work of this character. There are still a number of small fishing craft and passenger steamers under 120 ft. in length, that are constructed of wood, but even on the Pacific coast, the last stand of the wooden ship, the majority of all medium and large size work is steel construction. A second feature is the almost universal use of crude oil for fuel. All of the ships built during the past year are oil burners, designed to burn the crude oil from the oil wells of California. This has some bearing on the building of vessels on the coast, as the installations for burning California oil are, due to the nature of the oil, somewhat different from the equipment for burning eastern oil. Consequently ships for service on the west coast must be fitted with apparatus suitable for Pacific coast oil.

All the Vessels Oil Burners.

California crude petroleum consists essentially of carbon and hydrogen, together with oxygen, and widely

varying amounts of nitrogen and sulphur. The crude oil contains from 0.5 to 1.2 per cent of nitrogen. Sulphur is freely soluble in oil and occurs in the crude petroleum not only as a mere solution, but also very firmly combined to carbon and hydrogen as thio-ethers and mercaptans, commonly called roganic sulphur. California crude oil varies greatly in color and character, some oils being of a greenish or bluish fluorescence, while others are black and viscid. The specific gravity ranges from 0.993 to 0.850, or from 11 degrees Baume to 34 degrees Baume. The oils of California contain sometimes as much as 45 per cent of asphaltum, and from 0.5 to 2.5 per cent of sulphur. This chemical composition requires larger pipes and a different style of burner than for using eastern oil having a paraffine base. This in turn tends to influence the local buyer to favor the local Pacific builder who is familiar with the conditions and methods employed in burning California crude petroleum.

Two new departures are noted in the past year. The C. Minsinger, built by the Portland Ship Building Co., of Portland, for the Star Sand Co., of Portland, for use on the Columbia river, is the first tow boat to be built on the Pacific coast that pushes her tow in front of her after the fashion of the craft on the eastern rivers. The C. Minsinger is built of fir, is 150 ft. long, 39 ft. beam and 7 ft. deep and propelling engines of 250 H. P. The Capital City, built for and operated by the California Transportation Co., of San Francisco, on the Sacramento river, between San Francisco and Sacramento, has many features not found on steamers for river service. A magnificent ladies' cabin and smoking room occupy the forward portion of two decks, while aft on the same decks are the dining saloon and parlors, all finished in white cedar and old weathered oak with white cedar and oak furnishings. Barber shop, bath and staterooms with attached baths, are the special features that make the Capital City indeed a capital city and something entirely new for river work on the west coast.

The most palatial craft from point of hull construction finished and put into service on the coast during the

year is the government collier Prometheus, built to maintain a speed of 16 knots, carry 12,500 tons of coal and powered with 7,500 H. P. engines. The steel steam tug Oneonta, built for the Port of Portland by the Willamette Iron & Steel Works of Portland, for bar service at the mouth of the Columbia river, represents the latest designs of coast architects for this class of work. Oneonta is 116 ft. long, 25 ft. beam and cost \$92,350.

Work of the Moran Co.

The Moran Co., Seattle, have the past year completed and turned over to their owners, the Alaska Steamship Co., the La Touche, a steel freighter, the Comanche, a passenger steamer for the Puget Sound Navigation Co., and the Sioux, a second passenger steamer for the mosquito fleet on Puget Sound. The Union Iron Works, San Francisco, have delivered to the Monticello Steamship Co., of San Francisco, the Napa Valley, a passenger steamer for service on San Francisco bay.

Among the new work under construction is the steel, paddle, ferry steamer San Pedro by the Union Iron Works, of San Francisco, for the Atchison, Topeka and Santa Fe, a 7,000 barrel oil barge by Moore & Scott at Oakland, Cal., and two stern wheel steamers aggregating 3,600 tons by the Southern Pacific Co., at the West Oakland yards. New government work on the Pacific coast is limited to submarine torpedo boats, of which two are under construction at Moran Co. yards and two at the Union Iron Works plant and three more have just been contracted for.

Repair work has been a big item, as there have been an unusually large number of wrecks and accidents during the twelvemonth. The largest repair work now under way is the repair and reconstruction of the transport Thomas at the yards of Moore & Scott at Oakland, Cal., contracts for which now let totalling over \$600,000, and being the largest ship and the largest contract for repairs ever taken at the Oakland yards. Several salvage jobs of unusual interest have been completed, among which are the Yucatan, the Princess May and the Northwestern. The total repairs on these three ships amounts to over \$240,000. Two of the salvages were done in Alaskan waters and were made exceedingly difficult by the lack of facilities and the physical condition of the country.

The Commercial Boiler Works and the Heffernan Engine Works, both of

Seattle, have completed a number of very large repair jobs during the year, the largest of which was the repairs to the Ella and Erna, two German steamers that have been overhauled and reconstructed after much service in southern waters.

Repair Work Extensive.

During the past year many ships built in foreign yards have been put on runs in coast waters, first among these being the steamers Prince Rupert and Prince George, now operating between Seattle and Puget sound points, and Prince Rupert, B. C.

Briefly, the future for ship yards on the coast looks good for the most part, particularly as the constant growth and settlement of the coast is rapidly increasing the demand for good, fast, small tonnage, passenger steamers for the mosquito fleet of the coast cities. These steamers range in length from 240 ft. to 120 ft. and even smaller, although the smaller ones in many instances being powered with internal combustion engines. On the north coast on Puget Sound these vessels are almost exclusively screw propelled, while on the rivers in and leading to San Francisco bay, they are almost entirely stern wheelers. As business with Alaska increases the need for faster and newer vessels for the Alaska service is becoming more acute, and as soon as there is some adequate provision made for safeguarding ships running into Alaskan waters, much new tonnage will be built to replace the old carriers now in use.

For the present, between the eight-hour day now operating on some parts of the coast, and the almost entire extinction of an American merchant marine, Pacific coast yards are contenting themselves with doing what repair work offers and are waiting for something to happen that will give them a chance to come again into their own—the prominence they had in the earlier days—and an opportunity to build trans-ocean ships.

Schuette Recording Compass

The Schuette Recording Compass Co., of Manitowoc, Wis., had one of its latest type of recording compass on exhibition at the Hotel Ponchartrain, Detroit, during the convention of the Lake Carriers' Association, and also at the Hollenden hotel, Cleveland, during the meeting of the masters of the Pittsburgh Steamship Co.'s fleet of vessels. The instrument was in-

spected by a great many marine men and as the apparatus was connected up and operating, the demonstration was a big success. The company expects to install them on quite a few freighters and passenger boats during the coming season, and the shipping fraternity seem to take a great deal of interest in this new invention. Among the exhibit were a lot of actual charts taken on shipboard and some fine letters of recommendation from masters who have been using the instrument for over a year. The instrument shows variations of less than a quarter of a point, so that if the wheelsman lets her go off the course the instrument will immediately register the change of direction and also the exact time that it occurred. One of the instruments was installed on car ferry Pere Marquette 18, which foundered on Lake Michigan last fall, and a few of her charts made by the recording compass were preserved. They showed the course across Lake Michigan to be as straight as a line—a beautiful bit of steering. There was one chart, however, where the line was broken at one point. The wheelsman studied over that for a time and then exclaimed, "Well, that must have been where I lighted my pipe." The chart also shows the condition of the weather as, in a seaway, the records are irregular, while in smooth water the line is unbroken. The compass requires no attention except to put a new chart in the roll once a month, and to fill the fountain pen once a fortnight.

Analysis of Sault Canal Report

An analysis of the report of the superintendent of the canals at Sault Ste. Marie is quite interesting. While 12,927 ships used the American canals as against 7,972 ships using the Canadian canal, the Canadian canal nevertheless bore the greater part of both vessel tonnage and freight tonnage. The 7,972 vessels which used the Canadian canal had a net registered tonnage of 23,349,137 tons, while the 12,927 vessels which used the American canals had a combined net registered tonnage of 26,506,986, showing that the large ships sought the Canadian waterway. The freight carried through the Canadian canal was 36,435,557 tons as against 25,927,661 tons carried through the American canal. The total of 62,363,218 tons is the largest in lake history, the nearest being that of the season of 1907 when 58,217,214 tons were carried.

Average Ore Cargo

The average ore cargo carried on the great lakes during 1910 was 7,155 tons. This is 662 tons less than the average cargo carried in 1909, which was in itself a reduction of 548 tons, as compared with the average cargo carried during 1908. Therefore the average ore cargo carried during 1910 was 1,170 tons less than the average cargo of 1908. The reason for this is clear. A fair portion of the vessels loaded for the Poe lock, which had an available draught of 18 feet when it was placed in commission, increasing but a few inches throughout the year, and being several inches less than the available draught in the Canadian lock. Moreover stages of water continued low throughout the year, so that it is not surprising that the average cargo should be less than that of any year since 1906. The high average of 1908 is due to the fact that few of the small vessels were in commission during that year, owing to the industrial depression which continued throughout the year and which sensibly affected the movement of ore. Following are the average cargoes for the past sixteen years:

1895.....	1,800
1896.....	2,202
1897.....	3,556
1898.....	3,517
1899.....	3,803
1900.....	3,783
1901.....	4,459
1902.....	4,899
1903.....	5,668
1904.....	5,272
1905.....	6,101
1906.....	6,973
1907.....	7,516
1908.....	8,325
1909.....	7,777
1910.....	7,155

Safer on Water than Anywhere Else

The report of the Steamboat Inspection Service for the fiscal year shows that the loss of life from all causes among both passengers and crews during the year was 379 for 328,666,000 passengers carried, a ratio which works out at one-one thousandth of 1 per cent. This proves the contention of authorities that people are safer on the water than anywhere else, safer than they are on the streets of any large city and far safer than on any railroad.

The new steamer building for M. A. Hanna & Co. at the Lorain yard of the American Ship Building Co. will be named in honor of Quincy L. Shaw, of Boston, president of the Calumet & Hecla Mining Co.



DEVOED TO EVERYTHING AND EVERY
INTEREST CONNECTED OR ASSO-
CIATED WITH MARINE MATTERS
ON THE FACE OF THE EARTH.

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Hill's News Stand, Charles, near Canal st.,
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Charles Deferner, Galveston.
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Standard Book & Stationery Co., Victoria, B. C.
F. LeRay, 1306 Government st., Victoria, B. C.
Thompson Stationery Co., 325 Hastings st.,
Vancouver, B. C.
Central News Co., 916 Pacific av., Tacoma, Wash.
Oregon News Co., 147 Sixth av., Portland, Ore.

The Trail of the Serpent

The letter printed elsewhere in this issue and publication of which was declined by the New York *Sun*, is worthy of careful attention. Its author is a resident of, and does business in, New York, and his utterances are not therefore colored by local interest. He is exceedingly intimate with the navy crowd and was visiting in Seattle when Secretary Meyer some months since outlined the government's ostensible reasons for stripping the Pacific coast of battleships, among which were that the Pacific coast lacked docking facilities and that the necessity for shipping eastern coal to the Pacific made fuel too expensive.

In so far as the question of coal is concerned, THE MARINE REVIEW has already time and again exposed the misleading statements emanating from the department on this subject; not only their lack of truth but their utter childishness and inconsistency. They betray the desperate efforts of men possessing no technical knowledge of their own and driven to grasp at any straw of an excuse to cover up a shameless and discreditable transaction.

Mr. Gilman also shows that another of the department's excuses lacks the elements of truth. The navy and the army alike profess to believe that war is to be expected, if at all, on the Pacific, yet in the face of this the battleship fleet has been concentrated on the eastern coast, 13,000 miles away. If that war does come the inevitable results will lie at the door of the administration. But the navy will be safe and its personnel will have unlimited opportunity to bluster about what it would have done if it had only been there. The real reasons are well known to be that the Pacific coast is "too far from the Bowery" an incidentally the policy helps to boost along the demand for more battleships.

In making the statements Meyer did not voice his knowledge or opinion; we doubt if he can distinguish one end of a ship from another or a dry dock from a stone quarry; he merely spoke what had been put into

his mouth by his board of "aids," nevertheless he assumes responsibility for them and must bear the consequences, especially as this board is of his own making.

Mr. Gilman's letter only goes to prove that the need of reform in the navy department is making itself more widely apparent with each passing day. Some day the truth about this coal question will be known to all as now to a few, and in that day men will be seeking to hide their disgrace and blasted reputations.

Just Hear 'Em Roar

Decisive evidences of restiveness and discomfort under the prodding of THE MARINE REVIEW are manifesting themselves in the navy department these days. The article on "Naval Cost Keeping" in the December MARINE REVIEW, seems to have been about the last straw and to have produced great commotion. The Committee on Naval Affairs in recent hearings devoted considerable time to it and to extracting from Secretary Meyer denials in detail of the charges made, subsequently supplemented by letters from navy yard commandants.

As to the charge, THE MARINE REVIEW has no apology to offer; the information came at first hand *from within the department itself*, and although the committee did Meyer the honor to accept his statements in refutation, yet in view of the secretary's apparent disregard of facts in numerous instances, his pronounced bias and the fact that he and his system are on the defensive, we prefer rather to believe our information to be reliable. Certainly the statements actually printed were much modified from those submitted, and not anonymously either; nor is the standing or reputation of those officers who rallied by Meyer's order to his defense one whit higher than of our correspondents. If the committee or the department assume that the charges were made without good foundation, that is their affair, they merely fool themselves, and in accepting the statements of the secretary and his subordinates the committee does its discernment little

credit. They do not need to take our statements, as we have heretofore pointed out, but the truth cannot be had through the secretary.

One of the first things that engaged the committee's attention was the matter of the turbine casings and parts for the Florida. The department begs the question as to time and as to this our January issue contains official correspondence which fully bears out our charges and more and concerning which it is safe to say there will be no agitation. It attempts also to show that whereas for furnishing certain of these parts, outside firms asked \$43,700 the navy yard produced them for \$42,420.81, an apparent saving of \$1,271.19. Note the exactness of the cost keeping. The figures are not worth the space they occupy, as we have repeatedly pointed out. The private bid carried charges from which the department is free, as admitted by the secretary at this same hearing, and a good round profit besides, as anyone who has tackled government work knows.

If the same method of cost keeping is applied in both cases the private cost will be thousands below the yard cost, or if the same overheads and profit are added to the yard figures they would be nearer \$70,000 than anything else. It is merely a petty attempt to throw more dust and it is scarcely to be believed that the committee were misled.

The charges as to difficulty in obtaining information and juggling accounts are denied. The former is founded on actual experience and as to the latter, the departmental orders themselves furnish the proof. The accounts are juggled. The orders cannot be followed otherwise. For example, if expenditures for a specific purpose, say repairs or alterations to certain tools or equipment, fall below a fixed figure they go into one account, but if they exceed it, they must be charged to something else or divided up into fragmentary items. That is what the order says. If that is not jugglery, what is it?

The commandant of the Boston yard defends his yard and his sub-

ordinates against the charges made. As to the yard and the influence of politicians the denial is quite heated, naturally, but does not alter the facts; as to the officers, whom the commandant mentions by name, all the support in the world will not change a man's standing and reputation with his fellows, it rather aggravates it.

We do owe these officers an apology, however. Their knowledge of industrial works was questioned, but we note that the commandant, who has reached admiral rank and has therefore attained his majority at least, has served for fifteen long weary months at the naval station at Cavite and his aid sixteen months at the Washington navy yard. In view of those facts their experience and expert knowledge are of course no longer open to question. THE MARINE REVIEW cheerfully acknowledges their excellent equipment for navy yard management.

The charges as to the Rhode Island's battery and the general conditions of the ships on leaving the navy yard are indignantly denied and then immediately substantiated.

THE REVIEW intimated that a search might disclose two letters from the ordnance officer of the Rhode Island complaining of the work done at the New York yard. The correspondence submitted intimates that while there were two letters only one can be found, and this, although referred to as manifestly supporting the statements in the REVIEW, is suppressed, as well as parts of the commanding officer's endorsement, although the objection of the commandant and the commander-in-chief to the expressions used are apparently given in full. The case is made out without a detail lacking.

The report of proceedings of the naval committee is full of other information of interest. For instance, a report by the general board, Admiral Dewey, chairman, recommends that the fleet colliers Vestal and Prometheus, which have only just gone into commission, although commenced in 1904 and one of which, the Prometheus, has only once been to sea, and

the utter uselessness of which, with their inordinate and unjustifiable cost, were pointed out by the REVIEW three years since, should be converted into supply ships as soon as possible. Thus is public money squandered by an incompetent department. If the aborted monstrosities were taken out to sea and sunk, the country would save money even now.

We pointed out some time since that the privately designed colliers Mars, Vulcan and Hector were the most business-like ships the navy owns and would transport a ton of coal for a fraction of the cost by the bureau designs. In a statement submitted by the department to the committee on the cost of transporting coal in fleet colliers and dated Jan. 19, 1911, the Hector is selected and for manifest reasons. Yet even here the figures are not truthful and themselves confound their author. The statement says:

"It costs \$218.14 per day to maintain this collier in commission including pay and subsistence of officers and crew, stores and supplies, including coal." Elsewhere it is stated that her average daily coal consumption under way is 51 tons, worth \$2.70 per ton; that pay and subsistence are \$47,952 per year and various supplies \$13,371 per year. If the reader has any curiosity he will discover that this amounts to \$304.00 per day instead of \$218.00 and includes neither interest, insurance, depreciation, management and commissions, repairs, nor, of course, a profit. Yet the department attempts to show, using these juggled figures, that it can move coal from Hampton Roads to Portsmouth and Boston, about 550 miles each way, for 60 cents per ton compared with 70 cents in summer and \$1.00 in winter by commercial vessels, or at 80 cents to Key West compared with \$1.00 to \$1.25 in merchant ships, and is thus making money! The Hector, operated as a merchant ship, will probably carry coal almost as cheaply as any ship of her capacity, but she cannot do it at any such figure going light one way. To quote such costs is merely to talk nonsense.

We recently printed some figures on the costs of moving coal to the Pacific in naval colliers. The statement just quoted from also includes estimated costs in this service and which are of course equally misleading, being based upon incorrect daily expenses in the very beginning, yet which show that under naval management, the *Hector could actually make two round trips in a year and deliver a total of 4,896 tons of coal out of 16,000 tons taken aboard at a cost for freight of \$15.00 per ton compared with an average of \$4.25 per ton in private ships.* What is the correct figure? These are valueless and yet they are the department's own. And it should be borne in mind that even these are based upon a speed of only 9.3 knots, whereas the contract speed of these ships is 12 knots, which they exceeded on trial. At full speed the coal expenditure would of course be very much higher. The files of THE MARINE REVIEW show that we long ago anticipated the department in the preparation of cost figures on this collier question and we have even reason to feel satisfaction with our presentation. We commend Document No. 13, Committee on Naval Affairs, to those who desire more complete details of the discussion which our naval articles have produced.

Following hard upon the disclosures in our January issue regarding the Florida's machinery comes an apparently authentic report that the department has appointed a board to investigate a report that private contractors who are furnishing material for the ship are purposely delaying deliveries in order to cast discredit upon government construction. The report further says that the yard officials now blame private concerns for the delay in the machinery division and are talking of "conspiracy." We believe the report; the board will be appointed and will be composed of line officers who will discover that the delays, which the yard commandant over his own signature acknowledged he had not knowledge of, were due to the contractors; the commandant will be vindicated; the department will be vindicated; everybody will be

vindicated and no one to blame but the rascally contractor and the scapegoats who have probably been found by this time in obedience to Admiral Leutze's order. Beautiful system. Splendid example of high principle and manly honor. Hoyt's satirical comedy of "A Milk White Flag" occurs to us as descriptive of the valor and high aims of our ornamental navy department.

The Panama Canal

Twenty-nine years ago, when Ferdinand De Lesseps broke ground for the Panama canal, the London *Times* observed that whoever turned the first shovel full of earth, the United States would turn the last. That was certainly a prophetic statement. Since the property of the old French company was taken over by the United States government, in 1904, the work has progressed with the utmost vigor, and the latest information is that the canal will be opened to commerce in 1915. The entire length of the canal, from deep water in the Atlantic to deep water in the Pacific, is about 50½ miles. Its length on land is about 40 miles.

There will be 12 locks in the canal, all in duplicate. No vessel will be permitted to enter or pass through the locks under its own power. Electricity will be used to tow all vessels into and through the locks and to operate all gates and valves. The time required to pass a vessel through all the locks is estimated as three hours. The time of passage through the entire canal is estimated as ranging from 10 to 12 hours. The time of passage is, of course, inconsequential when it is considered that it saves the enormous distance of 15,000 miles involved in the trip around the Horn. The estimated total cost of the canal is now placed at \$375,000,000.

The commercial value of the canal is, of course, problematical. It may not be as great as is commonly supposed, but its strategical value to the United States is beyond all argument. In comparing it with Suez it must be borne in mind that the Suez canal connects two vast and thickly populated land areas while the Panama canal simply connects two wide oceans. East of Suez are the peoples of Asia; west of Suez are the workshops of Europe. The primary advantage commercially of any canal is the saving of distance. Whatever traffic can find shorter route than Pan-

ma will not use the Panama canal. Such traffic is nearly the whole of the commerce between Europe and Asia and Africa. For instance, Yokohama is 1,700 miles nearer London by Suez than by Panama, while Singapore is 7,400 miles nearer London by Suez and Sidney, New South Wales, is 1,200 miles nearer London by Suez. Trade, therefore, originating in Great Britain to these points will probably continue to go via Suez. The advantage in distance is all to the United States. By the Suez canal England is closer than the United States to Australia, China and Japan by about 2,700 miles. By the Panama canal the cities on the Atlantic seaboard of the United States will be only 1,000 miles further from Great Britain than Hong Kong and Central China; and they will be upwards of 1,200 miles nearer the northern ports of China, Korea and Japan; 2,700 miles nearer to the western ports of South America; 1,300 miles nearer to Melbourne, and more than 3,000 miles nearer to New Zealand. But the chief saving in distance is in northerly and southerly directions. The canal will provide a short and convenient route from the workshops of the Atlantic states to the west coast of South America, and from the Pacific states to the east coast of South America. The commercial wants on the western side of South America are at present almost exclusively supplied from Europe. When the canal is completed they ought to be supplied from the United States and probably will be if, as is pointed out elsewhere, the United States government does anything to stimulate American shipping, for it must be borne in mind that the canal will also provide Europe with a nearer route to the Pacific shores of North and South America.

It is impossible, of course, to predict the extent of commerce which this great artificial waterway will create, but the figures may not be as great as many suppose. The Walker commission calculated that the traffic available by 1915 would reach 7,000,000 tons. This is only one-third of that which passed through Suez during 1910, and less than one-ninth of that which passed through the Sault canal.

Howard's Ship Yard, Jeffersonville, Ind., has secured contract to build a new side wheel steamer for the Eagle Packet Co., of St. Louis. The new steamer will be 165 ft. long, 26 ft. beam and 5 ft. deep. Her engine will be furnished by the St. Louis Iron & Machine Works and her boilers by John Rohan & Sons, St. Louis.

The Pacific Fleet and Navy Coal

MR. D. H. Gilman, of New York happened to be visiting in Seattle when Secretary Meyer, of the navy department, outlined the government's reasons for not maintaining a Pacific battleship fleet, the principal reason ascribed being that of insufficient docking facilities, mentioning also the fuel expense due to the necessity of shipping Atlantic coal to the Pacific. Mr. Gilman is exceedingly familiar with the ways of the navy crowd, and when the New York *Sun* commented editorially on Mr. Meyer's views in a favorable light, Mr. Gilman undertook to set the *Sun* right. However, his communication was returned, but it is herewith published for its information and sound sense:

Editor *Sun*—Sir: In your editorial of Dec. 6 reviewing the annual report of Secretary of the Navy Meyer, the mouthpiece of the five admirals constituting the general board, occurs this paragraph:

Mr. Meyer has a word to say about the clamor of the people of the Pacific coast to have a battleship fleet on that side of the continent that it ought not to have been necessary to say. Owing to lack of sufficient depth in the Mare Island channel no big ships can get up to the San Francisco yard. Bremerton on Puget Sound is the only Pacific coast yard available; but Bremerton has no railroad communication and no dry dock yet completed for modern battleships. Under the circumstances there can be no question that for the present the battleship fleet must stay on the Atlantic side.

After a daily reading of the *Sun* for nearly 40 years, I am really grieved at such a sad lapse from accuracy on its part. "A word that it ought not to have been necessary to say," I agree; the word was not necessary and ought not to have been said because it was not true, as was well known to the Big Five. "Now mark how plain a tale shall put you down."

LARGEST DRY DOCKS ON BOTH COASTS OWNED BY U. S. GOVERNMENT.

Built:	Length	Width	Water over sill
	ft.	ft. in.	ft. in.
New York No. 3.....	668	105	29 5
Boston No. 2.....	750	101 8	30 7
Portsmouth, N. H.....	750	101 9	30
Philadelphia, No. 2....	754	102 7	30
Norfolk, No. 3.....	550	112	34
Charleston, S. C.....	575	113	34
Mare Island, No. 2....	752	102	30
Puget Sound, No. 1... Building:	650	92	30
New York, No. 4....	542	104	31
Puget Sound, No. 2... Pearl Harbor.....	863	135	38
About the same as Puget Sound.			

LARGEST DRY DOCKS—Private.			
Built:			
Newport News	806	162	30
Hunter's Point, Union Iron Works, San Francisco	750	122	30
Building:			
Will be under construction this winter at Hunter's Point, San Francisco	1000	150	36

DREADNOUGHTS—Types.			
North Dakota	Normal	Full	
	20,000	22,000	
518	85 2	26 11*	

Building—Types:			
Utah	21,825	23,000	
521 6	88 2	28 6 *	

Due for delivery August, 1911.

Wyoming			
	26,000	27,243	

Due for delivery June, 1912.

Battleships that have been docked on Pacific coast.

Connecticut			
	16,000	18,000	

Minnesota, 1909 at Puget Sound			
	16,000	18,000	

456 76 10 24 6

*Normal.

Atlantic coast			
Pacific coast			
U. S. vate.	U. S. vate.	U. S. vate.	U. S. vate.
Now available for Utah type, normal draught..	2		
Now available for Utah type, lightened	6	1	2 1
Now available that would take Wyoming, normal draught			
Now available that would take Wyoming, lightened	5	1	1 1
Building that will take Wyoming, normal draught	1	2	1
Available in 1913 for Wyoming and super-dreadnoughts	1	1	2 1

Thus it will be seen that there are three dry docks on the Pacific coast capable of docking any United States battleship now afloat. One of these, Mare Island, would need constant dredging of the channel leading to it to make it available, but that can be done when necessary. It is much in the same class in that respect with all the docks on the Atlantic coast, except Norfolk, Newport News and New York. The only large dock, No. 3, at the latter yard is out of commission much of the time because of its quicksand foundation and faulty construction, while the Puget sound dock has been constantly in commission ever since it docked its first ship, the Monterey, in 1896. In fact, it is now, as it always has been since completed, the best dry dock owned by the United States. The new dock at the Puget Sound yard will be by all odds the best of the new docks and will be completed long before the super-dreadnoughts are afloat—that is, if the Big Five so wills. The contractor was ten months ahead of his time, and had the dock about half completed, when he was ordered to suspend work

—probably for change of plans, or to preserve the department's record for slow work. True, the Puget Sound yard has no railroad communication except by car float, but in this respect wherein does it differ from the New York yard? From half to three quarters of a million dollars will give it rail connection whenever the government can spare that sum.

There had been for many years a large number of battleships stationed on this coast until they were withdrawn to the Atlantic side under the excuse that they were needed for fleet practice and to make up the magic unit of sixteen necessary for that purpose. While they were so stationed here there had never been any trouble in docking them, nor was there any trouble at San Francisco and Puget Sound in caring for "my fleet" on its spectacular parade around the world. Why, then, is it necessary to now set up lack of docking facilities as an excuse for exposing one great flank of the nation naked to attack, in fact inviting attack. Has somebody pricked the sixteen bubble and suggested that our costly ships should be able to fight in ones, two, tens or sixteens? And that otherwise we should go out of the business of building them? Why not give the true reason, whatever it may be? It certainly has no foundation in common sense or patriotism. In fact the present disposition of the naval force is a flagrant violation of duty on the part of the president as commander in chief of the army and navy, on whom the responsibility, in the final analysis, must rest. There may be no danger of attack, probably would not be any unless invited, as the course of the administration is doing. If half of the effective battleship fleet were added to the present Pacific fleet, including the armored cruiser squadron, it could, under brave and competent commanders, with the aid of the shore batteries, prevent an effective landing on this coast by even the most powerful nation on earth. The attacking force would be a long way from home and its docking facilities limited. Since the beginning of the era of iron and steel war ships no fleet has dared attack shore batteries nor has one fleet dared attack another except under very unequal conditions; witness Manila Bay, Santiago and the Japan Sea, at all of which rather poor target practice was indulged in against helpless targets. In case of attack the administration evidently wants to hide the ships behind a continent. Such a course may be prudent from some standpoints but it is not courageous or loyal.

The plan of the general board to make great naval bases at New York, Norfolk and Guantanamo on the Atlantic side and at Pearl Harbor, San Francisco and Puget Sound on the Pacific is undoubtedly sound, but when these bases are all completed and the Panama canal finished the same reasons as now obtain will still exist for providing a battleship fleet for each coast, for the canal will be an unsafe reliance, as was conclusively pointed out by Mr. John F. Stevens in his valuable paper on the Panama canal.

The department is just now going through again its semi - occasional horseplay of testing Pacific coast coal just as if it had not had in its possession for more than twenty years all that is to be known on the subject. The verdict is well known in advance. Everybody knows that the calorific value of George's creek and Pocahontas coals is slightly greater than of the coals of Puget Sound, but the latter are better than the coals of Japan or France on which the great navies of those countries are run. The department admits that in case of hostilities on this coast and any naval vessels were inadvertently caught here, they would have to burn Puget Sound coal. Why not burn it then in time of peace and get used to it and have the grate bars adjusted to its use? It seems to be quite satisfactory to the coastwise and trans-Pacific merchant marine and railways of this coast. If the Puget Sound coal won't do in time of peace, why not burn Comox coal from Vancouver Island, admitted by the department to be close up to Pocahontas and which can be landed at the Puget Sound and San Francisco yards at less than the freight paid to *foreign ships* for bringing coal here from Norfolk? If a private citizen were guilty of conducting his business in the way the navy coal business is conducted, he would be universally de-

nounced as a fool, but no private citizen conducts his business in this way, or thinks of doing so.

The Big Five and its mouthpiece should not flatter themselves that they are deceiving anybody by their fictitious excuses in the matter of fleet disposition or coal. The game is well understood and everybody, except the public safety, is prepared to see it played to the end.

D. H. GILMAN.

Seattle, Dec. 22, 1910.

Raising the Steamer Kitsap

Seattle, Jan. 28.—The practicability of utilizing a floating pontoon dry-dock to raise a sunken wreck has just been successfully demonstrated by a local company which with a 600-ton dock, of the above description, has raised from a depth of 240 feet the steamer Kitsap, 123 net tons, which was sunk in collision in this harbor Dec. 14. When the Kitsap went to the bottom, it was the general opinion that she could never be raised, not only on account of the great depth but also because of the handicap of severe winter winds and tides and the difficulty of making cables fast at so great a depth.

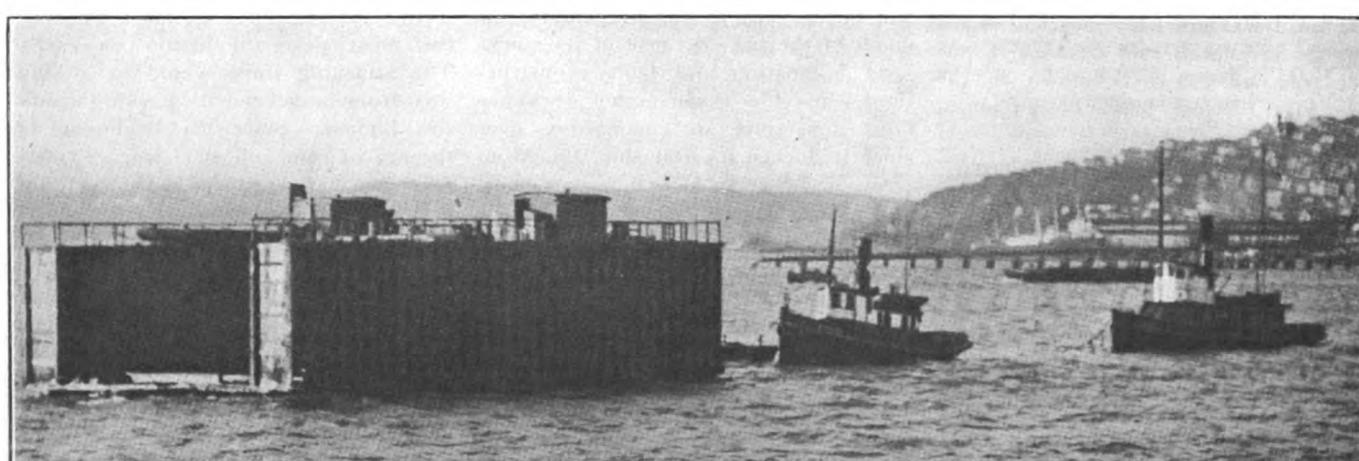
After the Kitsap had lain at the bottom for two weeks, the underwriters, who had previously buoyed the wreck, entered into an agreement with the Elliott Bay Dry Dock Co. by which the latter agreed to raise the steamer on the basis of being paid a percentage of the appraised value of what they succeeded in bringing to the surface.

The wreckers towed their dock to a position over the wreck, where the dock was anchored with two anchors placed at one end, allowing the dock to swing with the tides. Two tugs were chartered to attend the operations. A 1-in. steel cable was buoyed

at one end while the other end was swept under the submerged hull by the tug. On the third day the cable held fast under the bow and a lift was taken by sinking the dock and raising it by pumping out. When this was done a second cable, of the same size, was swept under the hull from the stem aft until it held fast about 15 ft. from the stern post. When a lift was taken with both cables, the tugs towed dock and hull inshore about 150 ft. but when the hull fetched up against the sloping bank, one of the cables parted. Then a 1 $\frac{3}{8}$ -in. steel cable was substituted. On the next lift, the second 1-in. cable carried away and it was replaced as soon as possible with a 1 $\frac{3}{8}$ -in. cable. With the two heavier cables no further breaks occurred. The length of the cables used was 1,600 ft.

After the wreck was held securely the dock was successively sunk and pumped out and with each lift both dock and wreck being towed inshore into shoaler water. At the outset the wreckers were greatly handicapped not only by the parting of the cables but also by the tides and stormy weather so that on several days operations had to be suspended. When conditions were favorable work continued both day and night. The longest tow at one time was 300 yards. The distance the wreck was moved from her original position until she rested on the bottom about 60 ft. from the surface was about 600 yds. From six to twelve men were employed on the job and with everything working smoothly it was possible to make five lifts in twelve hours. With each tow, the dock and wreck were moved into shoaler water until the hull rested on the bottom when another lift was attempted.

When the Kitsap was in 60 ft. of water a diver made the first examination and found the vessel lying with



TOWING THE STEAMER KITSAP INTO PORT

a list to port, on which side she had been rammed. Both cables were fast under the keel, one 30 ft. aft of the stem and the second 15 ft. from the stern post. The wreck was raised until within 28 ft. of the surface. During this time two more steel cables were made fast by the diver and then the wreck was successfully towed across the bay, a distance of three miles to be beached. She was moved across the harbor, suspended from the dock. After being temporarily patched the Kitsap will be placed in the dock which floated her and when this is accomplished the wreckers will have completed their contract. It required three weeks from the time the task was commenced until the vessel was beached.

After the cables were swept under the wreck large rings were slipped over the ends of each hawser and dropped, thus making them fast around the hull and preventing their slipping. The ends of the cables were brought up over the wings on either side of the dock and made fast. With each lift the slack was taken in and pleated, the necessary tackle being at hand to do this without delay. The first lift in particular subjected the dock to heavy strain as the wreck lay in three or four feet of mud.

The dock in question is 140 ft. in length, with beam of 34 ft. 6 in. and a capacity of 600 tons. For each lift, the dock was sunk 19 ft., being pumped out by two sixteen horsepower gasoline engines. The success of this salvage job will likely result in future experiments of a like nature.

The Kitsap is a wooden passenger and freight steamer, built at Portland, Ore., in 1906 for use on Puget Sound. She is of the following dimensions; Length, 127.5 ft.; beam, 22 ft.; depth, 7.5 ft.; gross tonnage, 195; net tonnage, 123.

Lake Ship Building

William P. Snyder, of Pittsburgh, president of the Shenango Steamship Co., has awarded contracts to the Great Lakes Engineering Works, of Detroit, for two bulk freighters to be larger than any now afloat. They are to be 617 feet over all, 64 feet beam and 34 feet deep, with a carrying capacity of 14,000 gross tons of ore on 19 feet draught. Their construction will require 8,500 tons of steel shapes and plates, which will be purchased from the Cambria Steel Co. It will be seen that the two steamers are to be 12 feet longer, 4 feet wider and 2 feet deeper than any bulk freighter on the lakes. It is understood that they will be built in the ordinary way and not

on the Isherwood system. Their engines are to be quadruple-expansion, with cylinders 23, 33, 48 and 69 inches diameter, with 42-inch stroke, supplied with steam from three Scotch boilers. They are to come out in 1912 and are to be built in anticipation of the completion of the third lock at the Sault, which will be 25 feet deep.

The American Ship Building Co. has secured the contract to build the new passenger steamer for the Detroit & Cleveland Navigation Co., to be known as the City of Detroit. The new steamer will be 60 feet longer and 1 foot wider than the City of Cleveland, being 470 feet over all, 55 feet beam, 93 feet over guards and 22 feet deep. Her engines will be compound with three cylinders 62, 92 and 92 inches diameter by 102-inch stroke, supplied with steam from four double-end and two single-end Scotch boilers. She will go into commission in June, 1912. Frank E. Kirby is her designer and Louis Keil will have charge of the decorative features. She will be built at Wyandotte and work will be started upon her at once.

The American Ship Building Co. closed contract on Jan. 30 with the Wisconsin Steel Co. for the construction of a bulk freighter to be 545 ft. over all, 525 ft. keel, 58 ft. beam and 31 ft. deep. She will have triple-expansion engines with cylinders 23½, 38 and 63 in. diameters by 42-in. stroke. Steam will be supplied by two Scotch boilers 15 ft. in diameter and 11 ft. 6 in. long. The steamer will be built at the Lorain yard and is promised for next July. The steel to be used in her construction will be furnished by the Jones & Laughlin Steel Co.

The Standard Oil Co. of New York gave contract to the American Ship Building Co. on Jan. 24 for an oil steamer and barge to be 260 ft. over all, 250 ft. keel, 43 ft. beam and 23 ft. deep. The steamer will have triple-expansion engines with cylinders 19, 31 and 54 in. diameters by 42-in. stroke, supplied with steam from two Scotch boilers, 14 ft. 6 in. in diameter and 11 ft. 6 in. long. The steamer will be built at Detroit and the barge at Superior. This order is a duplicate of the one given by the Standard Oil Co. earlier in the year to the American Ship Building Co.

The International Ferry Co., of Buffalo, has given an order to the Empire Ship Building Co., Buffalo, for a ferry boat to ply on the Niagara river between Buffalo and Fort Erie. The boat will be 160 ft. long and 40 ft. beam and is to be ready for service during the coming summer.

Launching the William B. Agnew

The bulk freighter William B. Agnew, building for the Buffalo Steamship Co. was launched from the Lorain yard of the American Ship Building Co. on Saturday, and was christened by Miss Kennedy, daughter of Hugh Kennedy, general manager of the Rogers-Brown Iron Co. The Buffalo Steamship Co. is the successor of the old Buffalo & Susquehanna Steamship Co., which was dissolved when the Rogers-Brown Iron Co. took over the Buffalo & Susquehanna Iron Co. Mr. Agnew, in whose honor the steamer is named, is the general manager of the Great Mahoning mine at Hibbing, and is consulting engineer for the Susquehanna mine. The launching was successful in every way and was followed by a luncheon at the Union club, the launching party traveling from Cleveland to Lorain and back in special cars. Some novelties have been introduced in the construction of the Agnew. For instance, her tank top is carried to the spar deck in the form of a hopper, practically making a double ship. Water ballast will not be carried to the spar deck, however, but will be obstructed by a shelf at the main deck, carried from the skin of the ship to the hopper sides. Her passenger accommodations will be unusually elaborate, and everything intended for their comfort and convenience will be housed forward, including the dining room and galley. Every stateroom will have a private bath and the music room, library and other quarters will be as complete as a modern home. The Agnew is 552 ft. over all, 532 ft. keel, 58 ft. beam and 31 ft. deep.

Ocean Mail Bill Passes Senate

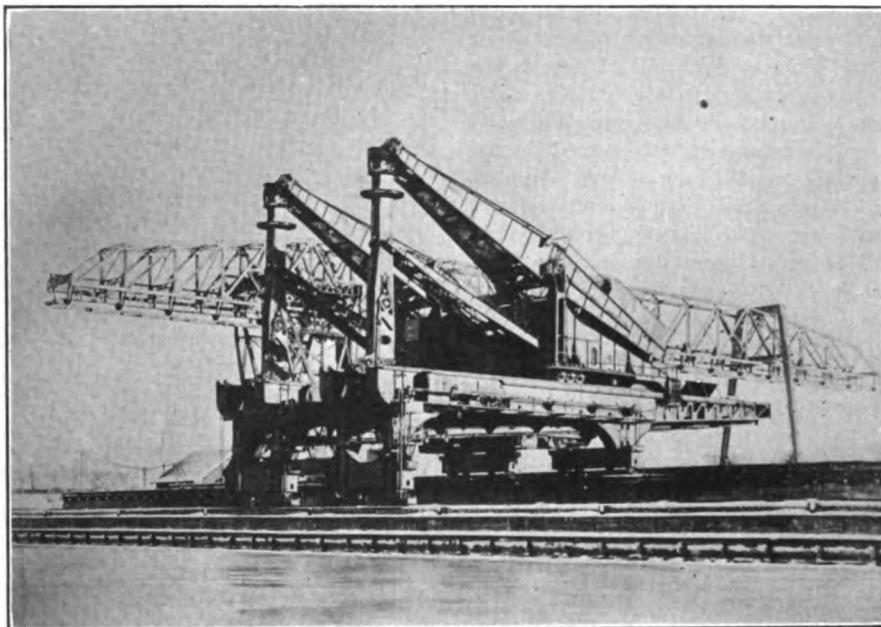
The vote which was taken on Feb. 2 on the passage of the ocean mail bill, both in committee of the whole and in the senate proper, stood 39 ayes and 39 noes, and on this occasion the vice president voted in the affirmative. As passed, the bill authorizes the payment by the Post Office department for the carrying of mails of \$4 per mile on the outward voyage to second class American built vessels plying between American ports and ports to Philippines, Japan, China and Australasia, and between American ports and ports in South America south of the equator, and the payment of \$2 per mile to third class American ships similarly engaged. It is a modest measure and should pass the house.

New Ore Unloading Plant at Toledo

WHEN navigation opens in the spring vessel owners will find the ore unloading plant of the Cincinnati, Hamilton & Dayton Railway at Toledo completely modernized. The work which was started on the new concrete dock in March, 1910, was

of ascertaining accurate weights of course being employed in passing the ore from the vessel to the storage piles, there being provided therefor a storage capacity of 1,000,000 tons.

The Cincinnati, Hamilton & Dayton Railway Co.'s dock frontage extends



THE HULETT ORE UNLOADING PLANT ON THE NEW CONCRETE DOCK OF THE CINCINNATI, HAMILTON & DAYTON RAILWAY AT TOLEDO TAKEN FROM THE WATER FRONT

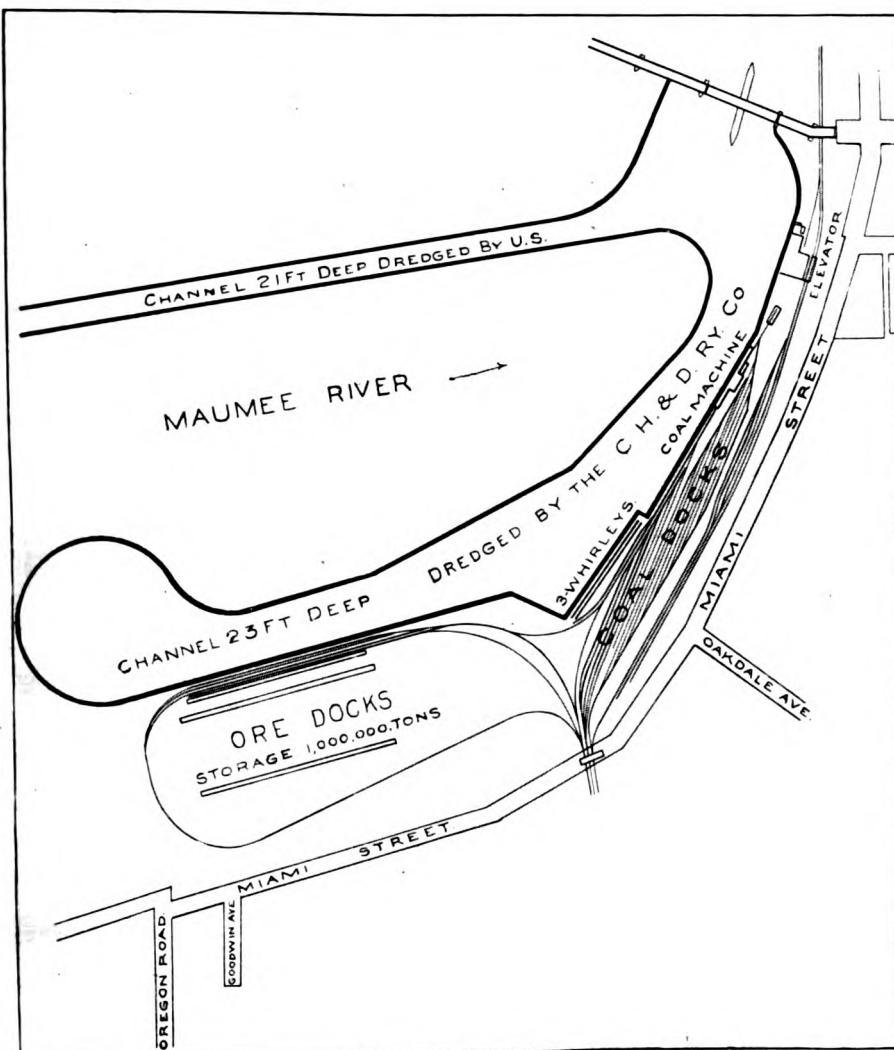
finished during the latter part of October and the dock has since been equipped by the Wellman - Seaver-Morgan Co. with two 15-ton Hulett fast unloaders with capacity capable of discharging a 10,000-ton steamer within ten hours. The guaranteed capacity of each bucket is 500 tons per hour, though in actual performance the buckets easily exceed this. The plant includes also an ore storage bridge and a transforming station. The transforming station is equipped with a motor generating set for transforming alternating current into direct current and is provided with a 10-ton fly wheel which takes care of the peak loads from the dock operations and makes the station load more nearly uniform. The ore upon being taken from the hold of the vessel is deposited in a hopper having a capacity of 60 gross tons from which it is dropped into a receptacle of 30 gross tons upon which are maintained accurate scales as it passes into the cars for shipment, the same method

three-quarters of a mile along the south bank of the Maumee river, extending up stream from the Fassett street bridge. The Great Lakes Dredge & Dock Co. was busy throughout the summer of 1910 in deepening the approach to the dock to the depth of 23 ft. and in constructing a winding basin of ample radius to care for the largest class of ore carrier.

The concrete dock is one of the best on the lakes, being approximately 1,700 ft. long with a depth of 433 ft. It consists of four walls known as A, B, C and D, each having a width of 16 ft. The distance from the front of A wall to the center line of B wall is 77½ ft., which is filled in with earth; from the center of B wall to the center of C wall, is 63 ft., and as this portion of the structure bears the weight of the unloading equipment it is reinforced with concrete diaphragms 24 ft. on centers. Earth filling is employed between C and D walls, a distance of 285 ft. About 415,000 cu. yds. of filling was taken out of the channel by hydraulic dredging and pumped between the walls, in addition to which the dipper dredge excavated 47,000 cu. yds. About 260,000 lin. ft. of piling was used for foundation under the walls. About 442,000 ft. of Wakefield sheeting is employed on walls A, B and C. About 23,000 yds. of concrete were used and 627,000 lbs. of reinforcing steel. Metal mooring posts of the latest design are installed at convenient intervals. The coal dock adjoining the ore dock is equipped with a modern McMyler



SIDE VIEW OF THE NEW CONCRETE DOCK OF THE CINCINNATI, HAMILTON & DAYTON RAILWAY AT TOLEDO SHOWING HULETT UNLOADERS



GENERAL PLAN OF THE CINCINNATI, HAMILTON & DAYTON RAILWAY CO.'S DOCKS AT TOLEDO

machine with a capacity of transferring from car to vessel 10,000 tons in eight hours.

Large Boiler Plates

A report comes from Glasgow that British steel makers are now rolling boiler plate up to 31 ft. 7 in. long, 12 ft. 5 $\frac{1}{4}$ in. wide and weighing over 21,000 lb. This corresponds to a thickness of over 1 $\frac{1}{4}$ in. The length and width can, of course, be varied and a greater thickness obtained and it is, therefore, now possible to build quite large single-ended boilers for fairly high pressures with only two plates on the shell. The extras added on these plates to cover the cost of equipment and risk of breakage of machinery are said to have run the cost up to \$94 per ton of 2,240 lb. Some of the more recently built mills in the United States have a capacity for even greater width and it is reported that the Steel Corporation is considering a 160 or 166-in. mill for Gary, but we are not aware that plates of the weight

and dimensions noted have yet been offered to the trade.

Lumber Carriers' Association

The annual meeting of the Lumber Carriers' Association was held in Detroit on Jan. 19. The following officers were re-elected: E. L. Fisher, Cleveland, president; O. W. Blodgett, Bay City, Mich., first vice president; E. M. Carleton, Cleveland, second vice president; W. E. Holmes, Chicago, third vice president; Capt. Walter D. Hamilton, Chicago, secretary and treasurer.

As very few lumber carriers have been built on the lakes during the last several years the tonnage of the association shows an annual loss. For instance, seven years ago there were 515 ships in the association classed as lumber carriers and the number is now placed at 215.

Grand Lodge Shipmasters' Association

The annual meeting of the Grand Lodge of the Ship Masters' Association was held in Washington on Jan. 27. Washington was selected as the meeting place in order that the various branches of the service having to do with the lake marine, such as the Steamboat Inspection Service and the Bureau of Light Houses, might be visited. Officers were elected as



FRONT WALL OF THE DOCK IN PROCESS OF CONSTRUCTION SHOWING ANCHORAGE PILING AND FOUNDATION FOR THE OTHER WALLS

follows: Capt. F. H. Herbert, of Buffalo, grand president; Capt. Al Mahon of Detroit, first vice president;



CAPT. J. A. HOLMES

Grand Secretary Shipmasters' Association

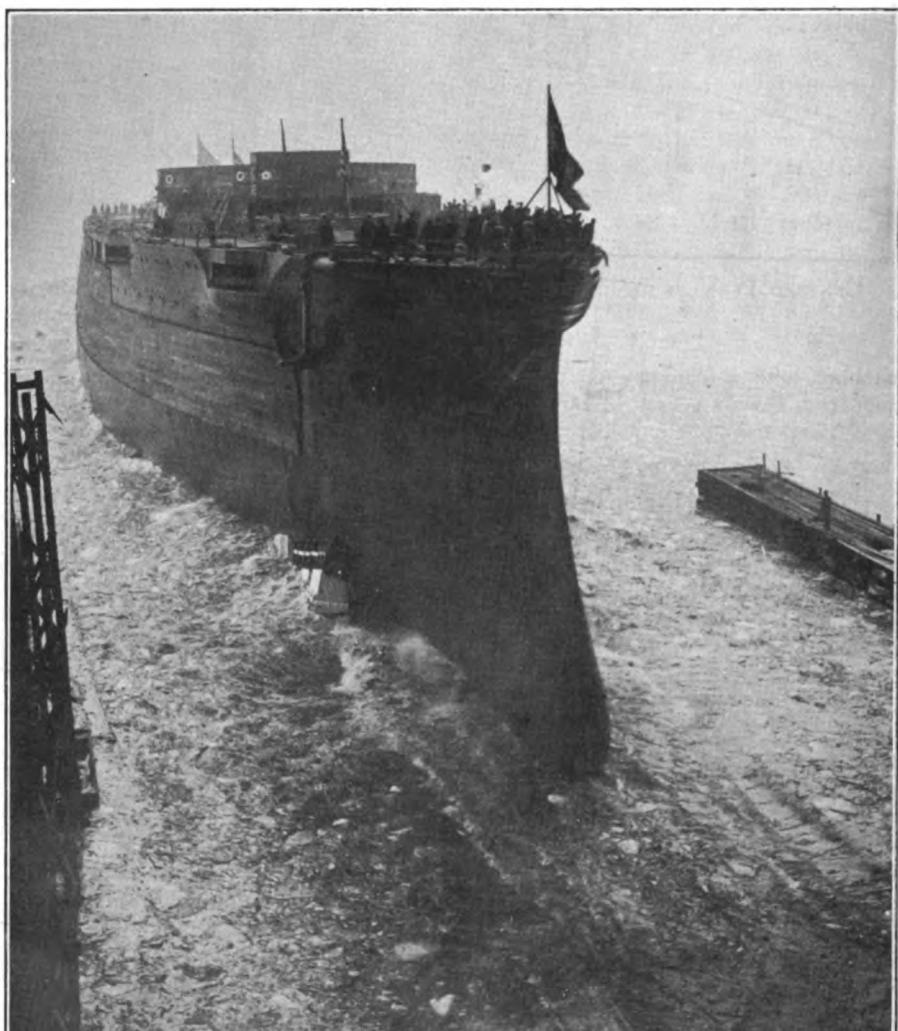
Capt. A. J. McKay of Detroit, grand treasurer, and Capt. J. A. Holmes, of Cleveland, grand secretary.

Capt. Holmes, whose portrait is published herewith, began sailing in 1850 as a cabin boy on the steamer Dover, plying between Buffalo and Port Rowan. In 1853 he shipped on the brig Concord of Cleveland and became mate of the schooner C. M. Johnson in 1857. In 1865 he was made master of the schooner Eli Bates. In 1867 he sailed the Imperial and was in the schooner Golden Rule from 1868 to 1872. In 1873 he joined the Bradley fleet, sailing the schooners, J. F. Card, Escanaba, Negaunee, Tilden and Thomas Quayle and later the steamers Superior, Fay, Hale, Ranney, Grover, Gladstone, Alva, and Hesper, ending with the Gladstone in the fall of 1906, when he retired. Capt. Holmes has been connected with the Cleveland lodge of the Ship Masters' Association since its organization. He was a delegate to the first convention in Buffalo when the grand lodge was formed and has served as president of the Cleveland lodge. He is the secretary of the Cleveland lodge as well as the grand secretary of the association.

Capt. Sam. W. Gould has opened the Pittsburg Steamship Co.'s nautical school on the sixteenth floor of the Rockefeller building, Cleveland.

Launching Battleship Arkansas

THE battleship Arkansas was launched from the yard of the New York Ship Building Co., Camden, N. J., on Jan. 14. She is for the time being the most powerful warship afloat though she will shortly be exceeded by some British battleships now building, mounting 13.5 in. guns. The Arkansas is of the following dimensions: Length, 554 ft., beam, 93 ft. 2 $\frac{1}{2}$ in., draught 28 ft. 6 in. The bunker capacity will be 3,000 tons and the speed contemplated is 20.5 knots at 28,000 I. H. P. The main engines will consist of Parsons turbines, six for going ahead and four for astern, driving four screws, steam being supplied by twelve Babcock & Wilcox boilers, fitted to burn oil or coal. The armor protection will consist of a belt of vanadium steel from 11 to 8 in. thick, 8 in. armor on casemates and 11 in. on turrets and barbettes and 3 in. armor on protective decks. When completed the Arkansas will have two funnels fore and aft, 6 turrets in axial line, two lattice work towers 120 ft. high, one forward of funnels and one between them and three secondary lattice work towers, one on each beam and one aft of after funnel. The main battery will consist of twelve 12 in., 50 cal. guns, mounted in pairs in turrets; two forward, the first with guns 34 ft., the second 40 ft. above water line; and four aft, the third and fifth with guns 32 ft., the fourth and sternmost 25 ft. above water line. The secondary battery will consist of twenty-two 5 in. 50 cal. quick-firing guns, four 3 pounders, two 1 pounders, and two 21-in. submerged torpedo tubes. Electric motors will be used to lift the ammunition from the magazines to the turrets. Her complement will consist of 85 officers and 1,030 men.



LAUNCHING THE BATTLESHIP ARKANSAS FROM THE YARD OF THE NEW YORK SHIP BUILDING CO., CAMDEN, N. J.

Electric Flash to Supplement Whistle Signal

To overcome the difficulty in exchanging whistle signals with vessels in wind at night, M. B. Benson, foreman of the Duluth-Superior draw bridge, invented and put in use at the

nalling when boats become "bunched" at night.

The present manual system of operating whistles by pulling a lever suggested the idea of operating whistle valves electrically with the flash signal, and experiments have shown that this is entirely practicable.

A patent has been obtained covering both devices and a company is being incorporated under the name of the Universal Flash Light Signal Co. with M. B. Benson as president, and with an office at Duluth, to manufacture and apply them to vessels and drawbridges. The accompanying sketch shows the arrangement and it will be noticed that the whistle valve is operated by a solenoid, of which the plunger forms the valve stem. The lever for manual operation remains connected for use when electric power is not available. In closing the circuit to operate the whistle valve through the medium of a push button, circuit is also completed for an electric lamp of about 425 candle power located on top of the fore mast.

It will be seen there are other ways in which the devices are of value, for instance, boats giving distress signals when a high wind prevails, when the whistle could not be heard and the light could be seen. In fog, masters are relieved of the labor of continually pulling whistle lever and the boat can be more readily located by approaching vessels.

Welin Quadrant Davit

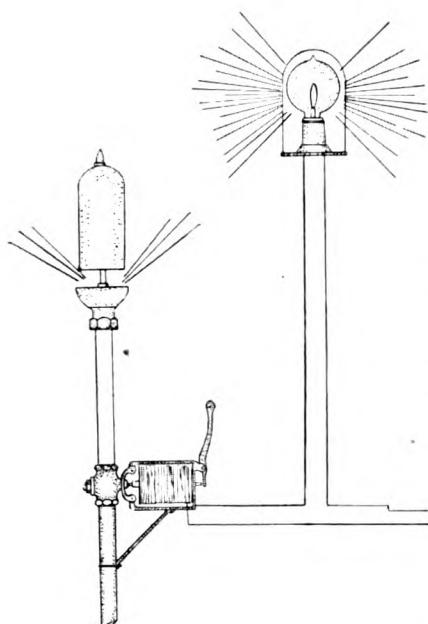
The Welin quadrant davit is steadily growing in favor and the vessels that are being equipped with it comprise an annually growing list. The advantages of this davit are generally recognized in the trade, and were very

clearly pointed out by Mr. Alex Welin in a recent address before a gathering of ship owners, ship builders and underwriters at Glasgow. Over 2,000 complete sets have now been fitted or are under order to be fitted.

"The great majority of designers," said Mr. Welin, "have apparently taken it for granted that the question simply resolves itself into one of removing the boats from one given position on deck to another given position outside the edge of the deck from which the lowering operation may, under ordinary circumstances, take place. If time permitted I would have no difficulty in showing that that supposition is fundamentally wrong, and that the problem is in reality of a much wider nature. Launching the life-boats is not generally required to be done under what may be termed 'ordinary circumstances,' nor can a ship owner be expected to sacrifice valuable deck-space for machinery, which he trusts will never be required for actual use, or to employ extra hands for keeping it in a state of efficiency.

"The success with which the Welin system has met mainly depends on its extreme simplicity, and its adaptability to varying circumstances. But it also offers advantages of considerable importance, not immediately connected with the life-saving question, and to which I will presently refer.

"While the original design has often been modified to meet special requirements—as a matter of fact it is now made in about 30 different types and sizes—complications and unnecessary additions have been carefully avoided. I have always looked upon the reliability of the mechanism as its most important quality, speed—at least within certain limits—being of secondary importance. Even with the ship listed



ARRANGEMENT OF ELECTRIC LIGHT SIGNAL

bridge last summer an electric light signal to work in connection with the whistle signal, giving a flash of the same duration and at the same time the whistle is sounded. The device worked perfectly at all times, causing much favorable comment by marine men, who saw the advantage of using it on vessels to avoid misunderstanding of passing and other signals and enabling masters to locate vessel sig-

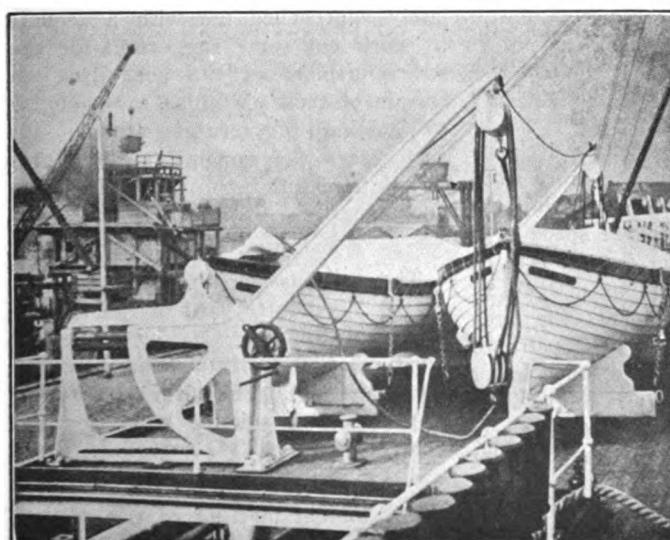


PHOTO A

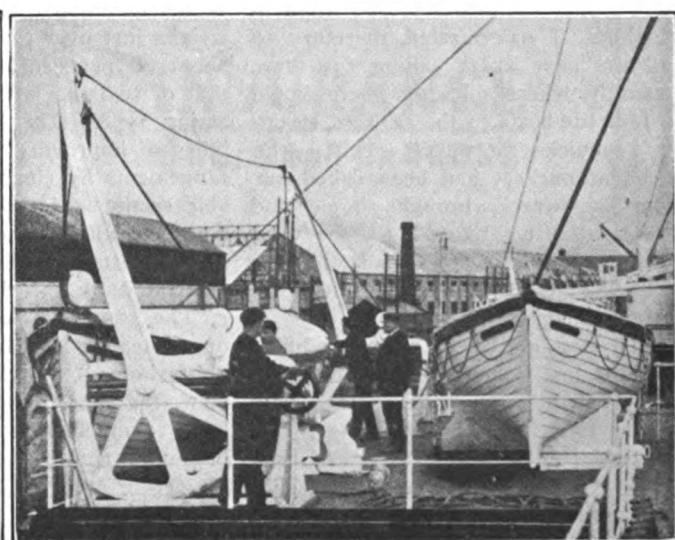


PHOTO B

to a considerable angle it should never require more than two or three minutes to launch a full-sized life boat by means of a set of Welin davits, and that is enough in point of speed.

"One interesting instance out of several which have come to my knowledge where these davits have been put to a practical test in cases of emergency, I must ask your permission to relate. The ill-fated Star of Japan, which was wrecked on the west coast of Africa some years ago, had two of

fidentially, the exact wording of it. It runs as follows:

"Notwithstanding anything contained in the rules relating to life-saving appliances, dated Feb. 10, 1902, and May 24, 1909, it shall be permissible in the case of such passenger or emigrant steamships as are required by the rules dated Feb. 10, 1902, to carry eight or more boats placed under davits, for boats, not exceeding in all one-fourth of the number required by the rules to be placed under davits, to

therefore not strictly in accordance with the new rule, but I have been given to understand that in a case where 25 per cent of the total number of boats would form an odd number, the board of trade would not refuse their permission to increase it to the next even number above, so as to make the two sides of the ship alike. Consequently, on ships carrying from 12 to 16 boats, the number of inboard boats permissible is four, two on each side of the ship.

"I have not yet had an opportunity to carry out any searching tests with this new type of gear, but may say that the superintending engineer of the Union Castle Line, who has fitted a number of sets in their recent steamers, is so pleased with them, that he has included them in the specifications of the three ships just ordered by his firm.

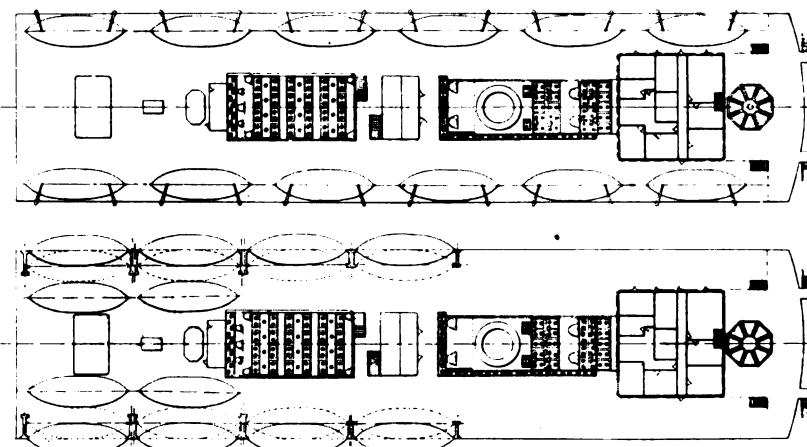
"The two White Star Liners, the Titanic and Olympic, are also to be fitted with this same type of double acting davits. Each vessel will carry sixteen sets, that is, enough davits to handle 32 life-boats. Twin frames, provided with a special arrangement for manipulating either davit arm without shifting the handle, are to be used between the boats. The outboard boats will rest on shifting chocks, permitting them to be carried half outboard at sea, thus leaving a clear passage of about 5 ft. between the two rows of boats.

"All inboard boats on these ships are extra boats, fitted in addition to the regulation complement, and I understand that no collapsible boats will be carried. The cost of repairs should thus be reduced to a minimum and the whole outfit will be one of the highest efficiency.

"It is interesting to note that several passenger carrying companies have lately approached me with a request to work out some suggestion for the re-arrangement of the boat deck on certain of their old ships, with a view to gaining promenading space. In such cases the concession above referred to naturally proves of immense assistance."

The new passenger steamer building at the Wyandotte yard of the American Ship Building Co. for Ashley & Dustin, of Detroit, will be launched on March 11. The firm is offering a prize for a suitable name for the boat.

The annual meeting of the officials and captains of the Cleveland Cliffs Iron Co. will be held Feb. 15.



DRAWING C SHOWING OLD FASHIONED ARRANGEMENT OF DAVITS AND THE SAME DECK WITH BOATS CARRIED INBOARD

her life-boats provided with Welin davits, the two remaining ones being slung from the ordinary type. In the captain's report of the catastrophe it was made quite clear not only that the latter proved utterly useless under the adverse circumstances prevailing at the time, but also that the fact that everyone on board having been saved was due to the efficiency of the Welin davits. In communicating this to me, the owner, the late Mr. Corry, of London, emphatically asserted that henceforth there would be no other type fitted in his ships. I was puzzled, therefore, to find the next order calling for three sets only, whereas I knew there would be four life-boats in the replaced steamer. Inquiries, however, elicited the fact that one set had been fished out from the wreck, brought home and would now be refitted to the new steamer, the Star of Canada. I am arranging to fit a suitable memorial plate to that set of davits.

"The most notable of recent modifications of my system is doubtless that illustrated by the model before you. On the basis of this design the Board of Trade have drafted a new rule, which is now on the table of parliament, and I am able, through the courtesy of the assistant secretary for the marine department, to give you, con-

tinuedly, the exact wording of it. It runs as follows:

"Notwithstanding anything contained in the rules relating to life-saving appliances, dated Feb. 10, 1902, and May 24, 1909, it shall be permissible in the case of such passenger or emigrant steamships as are required by the rules dated Feb. 10, 1902, to carry eight or more boats placed under davits, for boats, not exceeding in all one-fourth of the number required by the rules to be placed under davits, to

"The advantages of this concession are undoubtedly great. Firstly, the cost of installation is reduced. Then the reduction in weight is very considerable. A set of davits of the size shown in the photos marked A and B weighs just over two tons, a saving of about 30 per cent, as compared with that of two sets of my ordinary single acting type. Then comes the possibility of improving the whole deck arrangements by clearing the more valuable sections of the deck, shifting the boats elsewhere, where free space is of less importance. This feature is well illustrated by the drawing marked C.

"The top view represents the deck of a steamer fitted with 12 pairs of old-fashioned davits, and the lower view, the same deck, as it might have been arranged by the use of four sets of double acting and four sets of single acting quadrant davits.

"In this instance the double banked boats comprise one-third and not one-fourth of the total complement and is

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BOTH

SPUN and UNSPUN

ALSO

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AMERICAN AND FOREIGN UNDERWRITERS**

A Large Stern Wheel Shaft Repair

The shaft repair illustrated was recently completed by the Goldschmidt Thermit Co., New York, for the Lee Line Steamboat Co., Memphis, on their steamer Rees Lee, and is one of several quick repairs to Mississippi river steamboats, which have been executed by the Thermit process within the last few years.

The first of these was the welding of the stern wheel shaft of the Mississippi river steamer Betsy Ann, owned by R. F. Learned & Son, Natchez, Miss. This was a small shaft, however, compared with that of the Rees Lee, or of the Peters Lee, of the same line, which was Thermit-welded last year, the shaft of the Betsy Ann being $8\frac{3}{8}$ in. diameter, while that of the Rees Lee was 12-in. diameter.

The latter had been under observation for some time. A small crack was observed to have started and was gradually extending. Subsequently, it opened up so far that a permanent repair of some kind became necessary.

Owing to its success in welding a similar shaft for the same company a year previous, it was decided to have this work executed by the Thermit process, and the vessel was accordingly sent to Memphis, to which place the necessary materials were dispatched and preparations completed for making the weld.

The first operation consisted in cut-

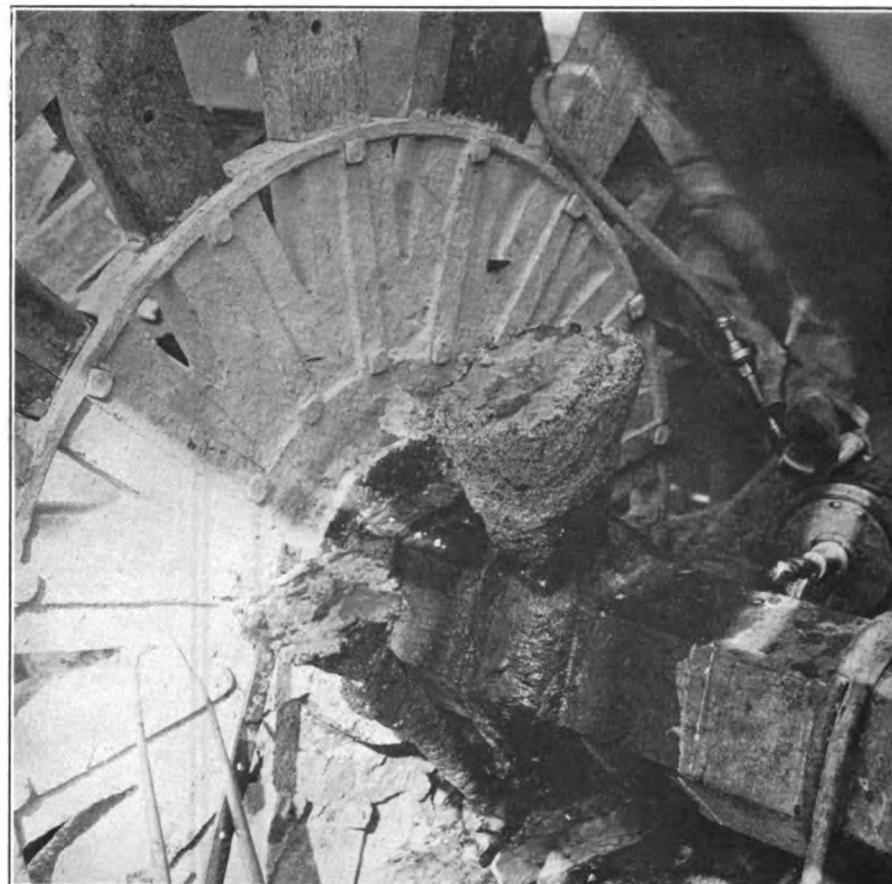


FIG. 2—SHOWING THE MOLD STRIPPED AND THE COLLAR AND RISER. THE LATTER IS CUT OFF AFTERWARDS

ting open the fracture by means of pneumatic chipping hammers to a steel I-beam across the top of the depth of about $4\frac{1}{2}$ inches. The shaft wheel with posts stepped on the main



FIG. 1—THE STERN WHEEL OF THE STEAMER REES LEE SHOWING THE STEEL SUPPORTING BEAM



HUTCHISON ROTATION INDICATORS SHOW AT A GLANCE

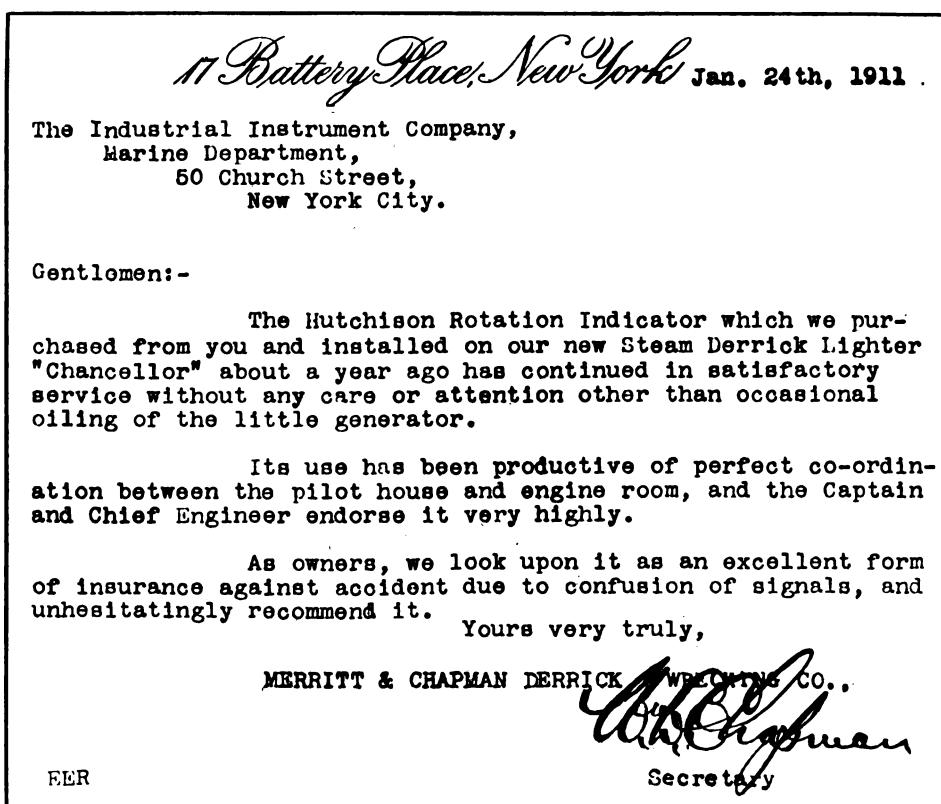
How **SIGNALS** to **ENGINE ROOM** are **EXECUTED**.

The Engineer operates his Engine to bring the Pointers to the Signal called for.

MISTAKES can be **RECTIFIED** before **DAMAGE** is done.

Indicators in Engine Room and Pilot House Operate Simultaneously.

The apparatus is exceedingly simple and will last as long as the ship.



THE INDUSTRIAL INSTRUMENT CO.
MARINE DEPARTMENT
50 CHURCH ST., NEW YORK

journal caps at each end as seen in Fig. 1.

Struts were then placed between the wheel flanges on top of the shaft and extending up to the I-beam and the shaft and beam securely clamped together so that the latter would take the weight of the shaft and prevent its sagging when heated at the point where the weld was to be made.

The shaft was then thoroughly cleaned at the fracture by means of a portable sand blast, after which a wax pattern was built up about 8 in. wide and 2 in. thick in the center, and of approximately semi-circular section. This wax pattern in the Thermit welding operation is always made of the exact shape of the collar which it is desired to fuse around the broken section. Wax is used in preference to wood as it does away with the necessity of making the mold in two parts, it being possible to ram the molding material around the wax, using suitable wooden patterns for gates, and risers and for a small preheating hole at the bottom. These wooden patterns are then withdrawn and the flame of a compressed air gasoline torch directed into the preheating opening. This melts out the wax and by keeping the torch in operation for one or two hours it is possible to bring the metal to be welded up to a bright red heat. As a matter of fact, the mold acts as a furnace in this case and the combustion, instead of taking place at the end of the burner, takes place inside of the mold itself, and serves to heat up the interior of the mold much more quickly than would be possible by any other method.

When the shaft had been properly heated the torch was withdrawn, the preheating hole plugged up securely with a dry sand core backed up with a liberal supply of molding sand, the Thermit in the crucible ignited and the resulting Thermit steel tapped into the space in the mold formerly occupied by the wax.

The exceedingly high temperature of the Thermit steel (estimated at from 4,000 to 5,000 degrees Fahr.) fuses the metal with which it comes in contact and amalgamates with it to form a single homogeneous mass, the result being that the fracture in the shaft was entirely filled up with this and a collar or reinforcement fused around the entire circumference of the shaft.

The mold was allowed to cool down very slowly and immediately on stripping the shaft a test was made for alignment, which was found to be correct.

Ore Docks in Breakwater at Cleveland

For nearly a year past the Pennsylvania railway has been filling in the west breakwater at Cleveland for a distance of 1,000 ft. from the shore line. The trestle work for the operation of the cars was built by the Standard Contracting Co., of Cleveland. Work upon the construction of a concrete dock will be begun in the spring, for which the Great Lakes Dredge & Dock Co. has the contract. Concrete piling designed by the Pennsylvania Railway Co.'s engineers will be used. The outer wall of the dock will be 1,700 ft. from the wall of the breakwater, affording ample sea room. The present intention is to construct a dock with a capacity of 5,000,000 tons of ore per annum. This will be gradually increased to 8,000,000 tons. The dock is to be ready by the opening of navigation in 1912. The type of machine has not yet been decided upon, though it is understood that the 15-ton Hulett plant is being favorably considered. It is not the company's intention to abandon the docks now in the old river bed, though the larger class of carriers will naturally go to the docks in the outer harbor when they are finished.

Modernizing the Union Steamboat Fleet

The steamers George J. Gould and S. C. Reynolds, owned by the Lake Erie Transportation Co. (Wabash railway), have been sold to the Union Steamboat Co. (Erie railway line). This gives the Union Steamboat Co. a fleet of eight steamers, and it is understood that plans are under consideration looking to a thorough overhauling and modernizing of the fleet. The work is in the hands of Babcock & Penton, Cleveland and New York, who have already instituted extensive alterations in the Tioga of this line and which work, including rebuilding and modernizing the propelling machinery and fitting of a mechanical draft, is now in progress at the Cleveland yard of the American Ship Building Co. A careful study will be made of the fleet during the coming season to determine its requirements and arrangements made for doing the work next winter.

The Falls Hollow Staybolt Co., Cuyahoga Falls, O., has appointed Thomas F. Meek, 415 Moffat building, Detroit, Mich., as its representative for Southern Michigan.

SUMMARY OF NAVAL CONSTRUCTION.

Name of Vessel	Building at	Per cent of completion.	
		Jan. 1.	Feb. 1.
BATTLESHIPS.			
Florida.....	Navy Yard, New York.....	86.6	89.1
Utah.....	New York S. B. Co.....	94.3	95.6
Wyoming.....	Wm. Cramp & Sons.....	48.6	51.0
Arkansas.....	New York S. B. Co.....	55.4	58.1
Battleship No. 35.....	Newport News S. B. Co.....	0.0	0.0
TORPEDO BOAT DESTROYERS.			
McCall.....	New York S. B. Co.....	99.1	*
Burrows.....	New York S. B. Co.....	96.3	99.5
Warrington.....	Wm. Cramp & Sons.....	92.7	97.8
Mayrant.....	Wm. Cramp & Sons.....	91.3	93.6
Monaghan.....	Newport News S. B. Co.....	61.7	65.7
Trippie.....	Bath Iron Works.....	87.0	93.1
Walke.....	Fore River S. B. Co.....	77.5	85.8
Amen.....	New York S. B. Co.....	82.0	84.7
Patterson.....	Wm. Cramp & Sons.....	57.9	60.3
Fanning.....	Newport News S. B. Co.....	0.0	0.0
Jarvis.....	New York S. B. Co.....	0.0	1.3
Henry.....	Fore River S. B. Co.....	0.0	0.0
Beale.....	Wm. Cramp & Sons.....	0.0	1.5
Jouett.....	Bath Iron Works.....	0.0	3.3
Jenkins.....	Bath Iron Works.....	0.0	3.2
SUBMARINE TORPEDO BOATS.			
Carp.....	Union Iron Works.....	78.2	80.1
Barracuda.....	Union Iron Works.....	78.2	81.8
Pickerel.....	The Moran Co.....	71.0	73.7
Skate.....	The Moran Co.....	70.9	73.6
Skipjack.....	Fore River S. B. Co.....	74.9	81.2
Sturgeon.....	Fore River S. B. Co.....	71.8	74.9
Thrasher.....	Wm. Cramp & Sons.....	26.9	29.5
Tuna.....	Newport News S. B. Co.....	47.6	49.5
Seal.....	Newport News S. B. Co.....	73.7	77.3
Seawolf.....	Union Iron Works.....	0.0	6.3
Nutilus.....	Union Iron Works.....	0.0	6.3
Garfish.....	The Moran Co.....	(No report.)	(No report.)
Turbot.....	Lake T. B. Co.....	66.2	73.6
COLLIERS.			
Neptune.....	Maryland Steel Co.....	66.2	73.6

*Delivered Philadelphia yard, Jan. 18, 1911.